

PORTABLE 100

The magazine for
Model 100* users

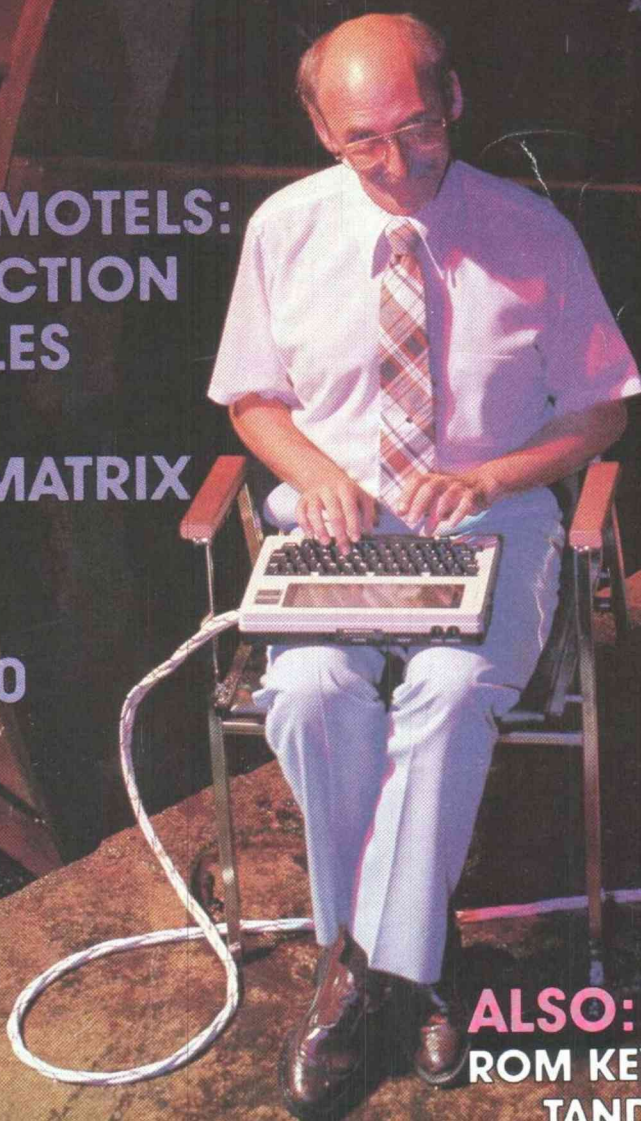
OCTOBER
1983
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POWER FOR YOUR 100

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NULL CONNECTION
FOR PORTABLES

FANCY DOT-MATRIX
PRINTING

CASHBOX 100



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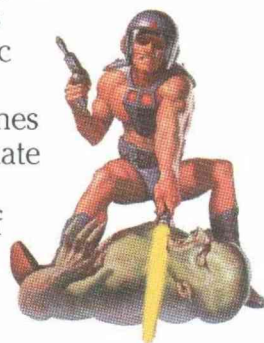
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When the price of batteries wears thin the bliss of true portability, take heart! There are alternatives to expensive AAs.

34 WILL THE 100 AND LODGING INDUSTRY MIX? By Paul Robbins

Most hotels and motels exist in an electronic Stone Age, and the cost and uncertainty of high-tech upgrades may keep them there for some time to come.

40 THE MODEL 100 AND THE MX-80: A POWERFUL DUO By Thomas E. Graves

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PORTABLE 100

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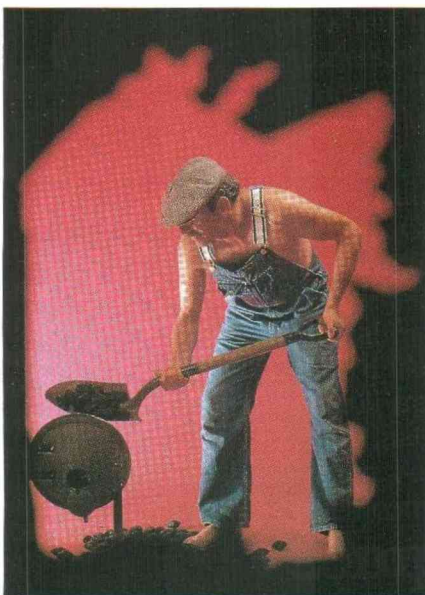
A Radio Shack dealer in New Hampshire finds the 100 a dandy point of purchase terminal. He thinks you will, too.

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This author-photographer used a little ingenuity and perseverance to get his 100 talking to his Kaypro II.

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Cover by Charley Freiberg

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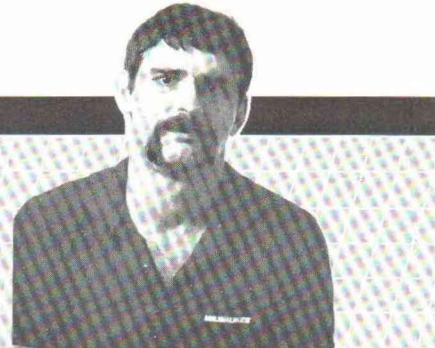
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PREVIEW



FROM CORRUPTING POWER TO PORTABLE POWER TO KEYBOARD POWER

Power. Lord Acton said it corrupts absolutely. In a way, true portability does, too. You might be three feet from a wall socket, but you won't use your AC adapter. It's like being on a leash. And that's not the way a cowboy and his 100 were meant to be. Hence, the power-portability connection.

With that problem in mind, I gave two former *Byte* editors, Charley Freiberg and Curt Feigel, a 100 for a weekend. (I generously gave them my publisher's; I couldn't part with mine that long.) I asked them to run down some alternative portable power sources for MEWS. Their findings begin on page 26.

FLAPPERS. Even if you're fully charged, there are other obstacles to untrammelled portable computing. Take hotels and motels, places where you're probably going to want to do some telecomputing. If you're planning a trip, you'd better have Radio Shack's acoustic couplers (reviewed in this month's review section by Terry Dettman), because chances are slim you'll find a modular phone. Tandy President John Roach's comments on the current state of the home telephone also seem to be an appropriate appraisal of the hotel telephone: "You get the best system that could be provided by Bell Telephone in the 1920's." Paul Robbins looks at this hurdle to portable bliss starting on page 34.

Speaking of telephones (and for that matter, power), one regional telephone company has already cooked up a scheme to all but prohibit home telecomputing. A red alert has been issued by a users group in the teeth of this problem.

Kerry Leichtman talks about a tax on telecomputing on page 64.

And speaking of travel, Bill Loudon (page 24) gives an excellent rundown on using the electronic edition of the Official Airline Guide on CompuServe to find the best rate to get where you're going.

WORD CRUNCHER. Since the release of the 100, I've heard people shy from calling TEXT a word processor. It's a "text processor," they say. That seems like a semantic game to me. And after taking a look at what you can do by imbedding printer codes in your text files (Tom Grave's article on page 40), you will realize what a powerful word cruncher you've got locked in your 100.

Peter Haas feels as militant about the 100 as I do. He sells the entire line of Tandy computers in his Radio Shack store in Keene, NH, but as he attests, his favorite is the 100.

Undaunted by what some chipsters would find memory limitations, he uses his MEWS as a point of purchase terminal, a cash register without a draw, and he'll show you how to do it, too, in his article on page 48.

ALIEN HACKERS. Those of us hacking with Radio Shack gear all of our computing life may not realize this, but there are other brands of computers. And the fact a person owns one of those alien brands doesn't seem to be deterring him or her from buying a 100. Jim Hughes, a Kaypro II owner, did. And his adventures (starting on page 51) in getting his transportable to talk to his portable are a lesson for us all, and one we can all learn from.

For the hard core among us, Jake Commander takes the 100's keyboard apart. Not literally, but surgically just the same. Beginning on page 55, Jake explains how to strobe the keyboard and increase your programming power beyond the reaches of INKEY\$.

There's much more in this issue, but I'm chalking it up to another power I'm sure you have: the power of discovery. ▽

A WORD ABOUT LISTINGS...

Packed program listings have been a bane for us for a long time. Granted, packing lines is necessary to make Basic run faster, but it can be hell when you're trying to figure out how a program works. For you newcomers, a program line may be made up of several program statements separated by a colon. So when you're going through a listing in *Portable 100*, keep the following in mind.

When you see a line like this:

```
830 PRINT
      :PRINTTAB(2)"IT TOOK YOU ";DM;"
      MIN. AND ";DS;
```

It should be typed like this:

```
830 PRINT:PRINTTAB(2)"IT TOOK YOU ";DM;"MIN. AND ";DS;
```

This may be a little confusing for the novice, but you'll soon see it makes the listings easier to type into your 100 and easier to understand how the programs work.

—The Editors

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Access Telecom

MEMORANDUM: Attention TRS-80 Model 100, IBM System/34 — System/36 and System/38 Users

October 1983

TO: TRS-80 Model 100 Users

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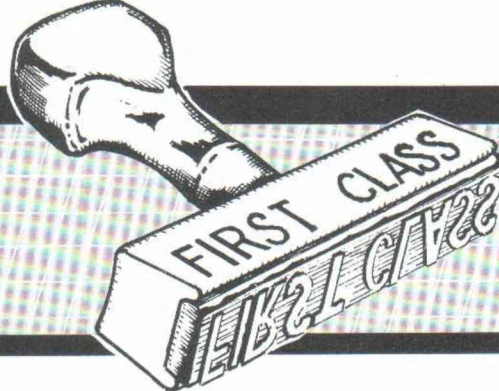
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MAIL 100



Editor's Note: While it isn't customary for a new magazine to have a letters section, Portable 100 is fortunate to also be system operator for the Model 100 special interest group on CompuServe. During the five months the 100 SIG has been on-line, many Micro-Executive Work Station enthusiasts have traded valuable information with each other. We think the new readers of Portable 100 will be interested in this sampling from the SIG. Each message writer is identified by his or her name and CompuServe identification number.

CHEAP TRICK FOR CHECKING CABLES

Here's a cheap trick for checking out cables and serial ports: Disconnect one computer. Connect pins 2 and 3 together (the numbers are usually embossed in tiny-tiny print in the plastic) in the cable or the computer RS-232 connector. You can use a standard paper clip if you have no wire. Be gentle! Don't push it in too far (you can judge how far by the length of the male pins on the other connector). Now, make sure you're in full-duplex, and try typing. The paper clip will feed the transmitted data back into the receiver. You should get back what you type in. Also, try taking the 100 and cables to your friendly Radio Shack, and ask them to help you try it out. What the heck: If it's defective, you'll wind up there anyway!

Ran Talbott
70506,60

THIS BUG ERASES MEMORY

I seem to have found a bug in the Model 100 ROM. I have done this on two different machines, so I

know it is not just a fluke. Take a 100 that has just been initialized (I don't know if that is necessary), and without an ADRS.DO file. Create a line of data (log-on information), then after entering only that one line, place the cursor on the start of the line and push F7 (select) and push the control right-arrow to move the cursor to the right end of the line. Now push F5 (copy) and discover you are locked up. Nothing but a power off will release you. When you power back on, you have recovered, however, SURPRISE! Memory has been wiped clean. If you push F8 (menu) first, then return to the ADRS.DO file again, it seems to work okay. I think the trick is you must have saved the file once before you can use the copy command.

C. Warren Andreasen
70235,1263

RECHARGEABLES AND WAFER DRIVES

I use Eveready rechargeable batteries in my 100. You can only get a couple of hours out of a set, though, as the output voltage of a nicad is 1.2 volts, while the output voltage of a carbon-zinc or alkaline battery is 1.5 volts. Thus, when the nicads start to droop a little in output voltage after a couple of hours, the low voltage sensor in the Model 100 turns on and your 100 thinks the batteries are about shot. I keep another set fully charged, then change them when they run down. At night, I pop all the batteries into chargers for the next day. Not exactly convenient.

Inside Tip: I think our wafer tape system [Holmes Engineering is developing a stringy-floppy drive for MEWS] will be able to power the 100 from its built-in rechargeable nicads. This will of course reduce the time the tape unit can run before

recharging, but I think it will be a big help to heavy users of the 100. At least you will be able to conserve the 100's batteries whenever you are plugged into the tape system.

Larry Holmes
75755,1012

CONVERTING 100 FOR EUROPEAN USE

Conversion to CCITT [European] modem tones is possible. However, the 100 is hardwired for U.S. operation. No gate exists as far as I can determine from the schematic. The conversion would involve:

- Isolate pin 14 of MC14412 modem IC(M31) and ground it (presently pulled up to Vdd through a resistor).
- Retune the 8-pole (input) and 2-pole (output) active filters in the telephone interface circuit. This means changing several resistors. Standard U.S. frequencies are 1270/1070 originate and 2225/2025 answer. Corresponding CCITT tones are 980/1180 and 1650/1850, so the changes aren't trivial.

I hope this helps anyone interested in European operation. I think it is obvious that the easiest method by far is to purchase a European version of the modem to use over there.

Keith Uddenberg
70735,1530

A NEW BRAND OF JOURNALISM

You once asked what I thought about the Mod 100 for your forthcoming magazine. Well, as a writer, I have found it permits a new genre of writing — Saloon Journalism.

I have been carrying it into the bars and saloons of Old Colorado

City and while quaffing the brew, research, write, rewrite, and electronically publish short pieces!

Now it is no big news for writers to file pieces from bar phones, but with the acoustic cups and direct access to online journals such as my own Sourcetrekk Magazine on The Source, well, one can go from shot glass to skywriting between rounds!

I am scribbling this (the keys are beginning to get blurry from a long afternoon) from the bar in the tiny town of Alma on the Continental Divide. I do believe the Model 100 is good for the writer's muse, whatever it does for the liver!

David Hughes
70260,202

SOLUTION TO CALENDAR PROBLEM?

Okay, here's my two cents worth on the dreaded year change bug.

I don't believe it has anything to do with batteries, power, phone connections, Basic, or the phases of the moon.

Based on prior work done with clock chips, I remember the clock chip will report bogus information if it is in the process of doing an internal carry (seconds changing from 59 to 00) when it is read. Empirical guesswork and deduction leads me to believe that the ROM reads the clock each time an interrupt occurs and updates the year when it sees a date of 01/01 and a time of 00:00:00. Please note that I haven't verified this—it's just how I would do it.

Due to the nature of the clock chip, it appears that the ROM believes the year has changed when the clock is actually doing an internal carry. Generating a lot of interrupts (such as doing communications at high baud rates) increases the likelihood of ROM looking at the clock during a carry, simply because it looks at the clock more often.

Assuming my theory is correct (and it is just a theory), how can the problem be corrected? In my earlier clock work, the problem was solved by reading the clock chip twice and comparing readings. If not equal, the clock was read again until two

readings matched. The way the 100 is designed makes this method very unattractive, due to the heavy overhead it would add. Patching ROM is a tedious process, what with prying off the top of the chip and all.

Probably the best fix would be a very small machine-language program, activated by interrupts, that monitors the year for a change and resets it if it is not a real new year. Lacking the time to research and implement all this, I have temporarily opted for the following two-line Basic kludge:

```
10 IF RIGHT$(DATE,2)>"83"  
   THEN DATE$=LEFT$(DATE,6)+  
   "83"  
20 MENU
```

Crude as we say, but effective.

Jim Stutsman
70130,101

CASSETTE BUG IN LAND OF MAPLE LEAF

My trouble is I can't load more than 10K-bytes of text or Basic. Sometimes the loading procedure works, but in many cases it aborts with an I/O error message. Every 100 with a serial number lower than 306001901 can't load big files (10K or more) correctly. I am located in Montreal, Canada, and the Radio Shack in Barrie, Ontario, confirmed the problem to me. Radio Shack has agreed to replace my 100 with a good one.

Daniel Neidhart
70106,353

My serial number is 302... and I am not having any trouble. I don't know whether I have ever tried to load a large file, though (I'm keeping my fingers crossed; my warranty is over!) I had a problem while I had 24K of RAM. The problem disappeared when I had an additional 8K installed.

The problem occurred while reading a text file on cassette using a Basic program. The program had to read the file twice, close it, and re-

wind the tape in between. It would read the tape perfectly the first time, but would get an I/O error on the second try. The whole sequence of events is becoming dim now, but as I recall, I experimented with a smaller file and found that, although the second pass would run, some data at the beginning would mysteriously disappear on the second pass. I inserted extra statements in the program to attempt to find out what was happening, and it worked!

For a while, I simply had the program stop after the second open statement. After getting the additional 8K, the problem disappeared. Perhaps Radio Shack did more than just add 8K—perhaps they knew there was a problem and fixed it. I guess I'll never know!

Guerri Stevens
75675,1220

CCR-81 MAKES 20K OF TEXT REAPPEAR

When my wife and I first got our 100, we purchased the Radio Shack Miniset. It seemed a reasonably compact companion to such a portable computer. They both fit comfortably in a thin brief case—with room for enough tape to keep track of both our jobs on joint business trips.

However, we experienced a 20 percent failure rate. On a business trip to Holland, my wife entered 20K of text (a full day's work). We made two backups on the Miniset in order to make room for more files. Later attempts at retrieval only generated I/O errors in both tapes! Our Radio Shack also was unable to load the tapes on its 100 or Miniset. We tried every possible combination.

Finally, we tried the tapes on the Radio Shack CCR-81 computer cassette recorder. The lost text magically appeared. Since that time we only trust our bulky, cheap CCR, which no longer fits in my briefcase. This is most unfortunate for people who travel light. Surely Radio Shack can come up with a compact mass-storage device to make this marvelous machine as flexible and useful as its designers must have intended it to be.

Paul Mifsud
70116,724

FULL-DUPLEX



Editor's Note: Full-Duplex is dedicated to solving readers' Model 100 problems. This issue, Terry Kepner will be answering some questions on the 100 that have popped up since he's had his machine. Readers needing assistance should address their letters to Terry Kepner c/o Portable 100 Highland Mill, Camden, ME 04843.

BUBBLE MEMORY DEVELOPMENT

I've heard rumors that bubble memory devices will soon be available for the Model 100. Is there any truth to them?

Need More Storage
Staten Island, NY

▲ The rumors are true. Dennis Kitsz (Green Mountain Micro, Roxbury, VT 05669, 802-485-6112) is currently designing a bubble memory device for the Model 100. The hardware comes in a plastic case you attach to the bottom of your Model 100. This will make the Model 100 about half an inch thicker than it is now, a small price to pay for the added convenience.

The unit will come as either a kit or assembled. The minimum system will be 128K, with 128K upgrades to 512K. The upgrades can be user installed, if you're handy with soldering, otherwise you can have a technician install it for you. The 512K restriction is dictated by the case. It has room for only four bubble-memory modules.

Power will be supplied either by a 120 VAC to 6VDC converter or 10 AA batteries. The batteries should last through about a month of average use.

The large number of batteries is needed because the bubble-memory device support chips are standard

integrated-circuit chips and not CMOS, low-power chips.

In operation, the bubble-memory device will remain off except when actual data input-output exchange takes place.

The device should be available sometime soon. The projected cost is between \$700 and \$900 for the first 128K, and \$500 to \$600 for each additional 128K.

WILL HEAT HURT 100

I use my 100 while on the road. I don't always want to carry it when I leave my car, but I'm worried about locking the unit there, as my home base is Tucson, AZ, and the car gets extremely hot sitting in the sun. Will the heat hurt my computer?

Baking
Tucson, AZ

▲ Having lived in Arizona, I know what you mean. In fact, I've melted the case of more than one plastic transistor radio by leaving it in the sun in my closed and locked car.

The 100 could probably withstand the high temperatures of a sealed car (upwards to 180 degrees, I've been told), but the LCD is another story. The chemicals used in the LCD are temperature sensitive, with possible damage occurring when the temperature exceeds 120 degrees. The result is a darkened display. Repeated exposures could destroy the display. Similarly, the CMOS chips aren't rated for temperatures over 150 degrees. At that temperature their reliable operation isn't guaranteed by the manufacturer. Exposure to such temperatures won't harm them, as such, but you won't be able to use the computer until the integrated circuits' temperatures fall to more reasonable levels. Repeated

exposure to extreme temperatures could possibly cause long term problems with the Model 100's electronics.

IPL PROGRAM SURPRISES USER

I have a problem with an IPL program. Sometimes it goes so long without doing so that I forget I IPLed it. Then, suddenly, I power up, and there it is!

What gives?

Startup Stuck
L.A., CA

▲ According to the manual, the IPL command defines the file name you give after it as the warm-start program (as opposed to cold-start, which erases all memory). The file name you type is supposed to be the name of a current RAM file. In order for the IPL to work, you must be in Basic when you turn the 100 off and the IPL program must be loaded in Basic.

So, if you want the IPL program to execute the next time you turn on your computer, you have to have the program in Basic and turn off your computer from Basic, not menu, TEXT, or TELCOM.

DOW JONES DIFFICULTIES

I'm having problems signing on to the Dow Jones Information News Service using the log-on program in the Model 100 manual (page 199). Is it my fault, the phone lines, or the program?

No DJ
Prospect, KY

▲ It's the program's fault. There's an error in line 20, which says: 20

PH\$="5551234<?pA?PDOW1;.
Line 20 should say: 20 PH\$="55512
34< ?pA?pDOW1;. Replace the
uppercase P after the second ques-
tion mark with a lowercase p. Up-
percase and lowercase is very signifi-
cant in log-on sequences, so be care-
ful of your typing!

FINE AT HOME, NO GO AT OFFICE

I'm having a strange difficulty, I can't get my Model 100 to auto-dial CompuServe when I'm at the office, but it works just fine at home! Manually dialing and going to term when CompuServe answers works, but not auto-dial. Can you explain what's happening?

Offline at the Office
Portland, OR

My first thought is to ask whether you're using one modem cable at home and another at the office, or if you're using one cable for both jobs. If you're using two cables, check to make sure the office cable is properly connected to your phone line. The beige cable must be plugged into the phone wall cord. The cable won't work if you have the wrong end plugged into your phone. Check your manual for the right orientation.

If you're using just one cable, I would suspect the difficulty is with your office phones. Does your office use a private PBX? Some of the non-Bell telephone systems won't allow pulse dialing through their switchboards. If you are using a PBX, make sure you include the outside lines access code, usually a nine, in the autodial sequence.

If none of these work, the problem is with the phone lines and equipment at your office. I've heard this complaint before and have it myself. My unit won't autodial to one CompuServe telephone number, but will to another. Both calls are coming from my home phone. The only difference between the two numbers is that the first one has lots of high digits (eights and nines) while the other has low number digits (threes and fours). Apparently my telephone system, New England Bell (rotary in Peterborough), can't

cope with pulse dialing if lots of high digit pulses are used for dialing. Even putting a pause (=) between the digits doesn't help.

MANDATORY DEBUG IN THIS PROGRAM

I noticed something strange with my Model 100 Basic. I had a program that I was writing. At one point I typed run and the program crashed with an error. I gave up and pressed the F8 key to return to the menu. The next time I returned to the program, it had the same display as when I left it, error and all! This happened several times until I decided to work on the program again and the problem went away. What happened?

Restored Display
Littleton, MA

I tried to duplicate your "problem" and had limited success. The program I wrote didn't reproduce the display until I named it. Everytime I entered Basic, the Basic sign-on message was displayed, followed by the OK prompt. Pushing F5 listed the program, while F4 ran it. Running the program produced the error. After naming the file, the program bombed on the error when I entered it from the menu. I think your problem is a result of the standard operation of the computer. Whenever you position the menu cursor over the name of a Basic file,

it's automatically executed when you press the enter key. If the program has an error in it, before any user prompts, it will bomb out on the error, resulting in the recreation of the display when the program was last edited. Working on the program eliminated the error before your prompts and consequentially solved the problem.

TAPE RECORDERS

Is there an alternative to the Radio Shack CCR-81? I find it too bulky for convenience.

Hands Full
Abilene, TX

You could try the Radio Shack Minisette 9. It seems to work adequately and is less than half the size of the CCR-81.

CLOCK PROBLEMS

For some reason the clock display on the Menu screen sometimes increments to the wrong year, usually 1985. What's wrong?

Time Off
Baltimore, MD

I don't know. Mine has also done that. Several people I've talked to have complained about this problem, but no one has figured out why, yet.



LOWERCASE ON COMPUERVE

When I was in the Authors SIG (Special Interest Group) on CompuServe last week, I saw a comment from someone about enabling lowercase on their computer. Do they mean that I can have lowercase displayed on my display? And that I can send lowercase instead of all uppercase? I thought everything was in uppercase only.

Locked in Uppercase.
Monroe, WI

▲ When you first sign on to CompuServe, the service assumes you have a non-standard terminal and sets up your terminal options so everything you type is displayed in uppercase and everything you send is in lowercase. It also assumes you have a 64-column display screen. There're other assumptions included, but I won't go into them.

The CompuServe Information Service (CIS to its users) normally operates in both upper-and lowercase modes, automatically configuring the information to match your sign-on terminal. As yet there isn't a default setting for the Model 100, so CIS assigns you the designation of other and locks you into uppercase only mode.

To change these default settings you have to go to user information section and change your terminal defaults. To do this, type GO CIS-4 from any CIS prompt (!), or from CIS page one select option 5. When page CIS-4 appears, choose option 4. You want to change your terminal options to 39 characters per line, upper/lowercase receive, and upper/lowercase transmit. Don't worry about being confused, the prompts in this section are simple and direct, and nothing is permanent until you decide to leave this section of CIS. When you do leave, you have the option of either making the changes effective for only this visit, or effective everytime you sign-on from now on. If you're not sure of the settings you've chosen, make the changes effective only for this time. If you de-

cide they're okay, then either make them permanent before you leave the service by going to CIS-4 and re-doing the selection, or reassign them and make the changes permanent the next time you sign-on.

EMPTYING THE PASTE BUFFER

What is the proper sequence for emptying the paste buffer? Several times I've run out of room, only to discover later that the problem was a large amount of text in the paste buffer.

Pasted
Norwood, MA

▲ To empty the paste buffer, just assign a null string to it; that is, copy nothing into it. Whenever you want to flush the buffer, press the select button (F7), then press either the copy (F5) or the cut (F6) buttons. Don't press any other keys between the time you press F7 and F5 or F6. By not selecting any text after pressing the F7 button, you're telling the Model 100 to copy nothing into the paste buffer. Any space taken up by text previously assigned to the paste buffer is released as available RAM. Also, going to Basic and running a Basic program will eliminate the text stored in the paste buffer.

THE MYSTERY OF THE LOST LINE

I have run into a problem that has me stumped. Sometimes, when I'm editing a program, the line I'm working on doesn't make it back to Basic in either its edited or original form. And this is without any warning at all. What's up?

Lost Lines
Radnor, PA

▲ I thought I was the only one who had that problem. It happened to me with the first program I wrote. For some reason the edit function from Basic doesn't always work right. It has something to do with the length of the line being close to the maximum length allowed and the condition of Basic when you go into

edit. If the line is grossly too long, you get a warning. This bug is almost impossible to get to occur except in the exact right circumstance. It's just something we'll have to live with until Radio Shack releases a new version of the ROM.

ERASE ALL FROM CURSOR SCREEN BOTTOM

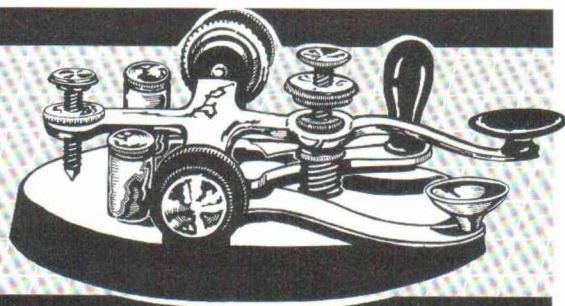
On the Model III, I can use the statement PRINT CHR\$(30) to erase all information from the cursor position to the bottom of the screen. The 100 doesn't have this command listed. Is there some way to do this? I tried using a series of PRINT commands, but PRINT doesn't erase the information on a line at all, it just places the new information over the old. If the old information is longer, then it isn't entirely erased, causing reading problems. The only solution seems to be to use the STRING\$ command to print a series of blanks over the display, starting at a predetermined point and running to the next to last position. But if something is in the last screen position, it can't be erased without scrolling the entire display, defeating the purpose of the STRING\$.

Confused Display
Elm City, NC

▲ If you want to erase information from the cursor to the end of the screen use PRINTCHR\$(27);"J". To erase information only on one line, use PRINTCHR\$(27);"K". For fun displays, use CHR\$(27);"p" and CHR\$(27);"q" to turn reverse video display (light dots on dark background) on and off. Other useful codes are CHR\$(27);"h" which homes the cursor to the top left corner of the screen without clearing it; CHR\$(27);"P" and CHR\$(27);"Q", which turn the cursor on and off; and CHR\$(27);"L" which scrolls the information after the cursor down one line, in effect inserting a blank line into your LED display.

These escape codes only work from a Basic program, you can't type them in directly and have them work. 🐘

THE WIRE



SHIRLEY'S DEPARTURE BOON FOR MICROSOFT

By JOHN P. MELLO JR.

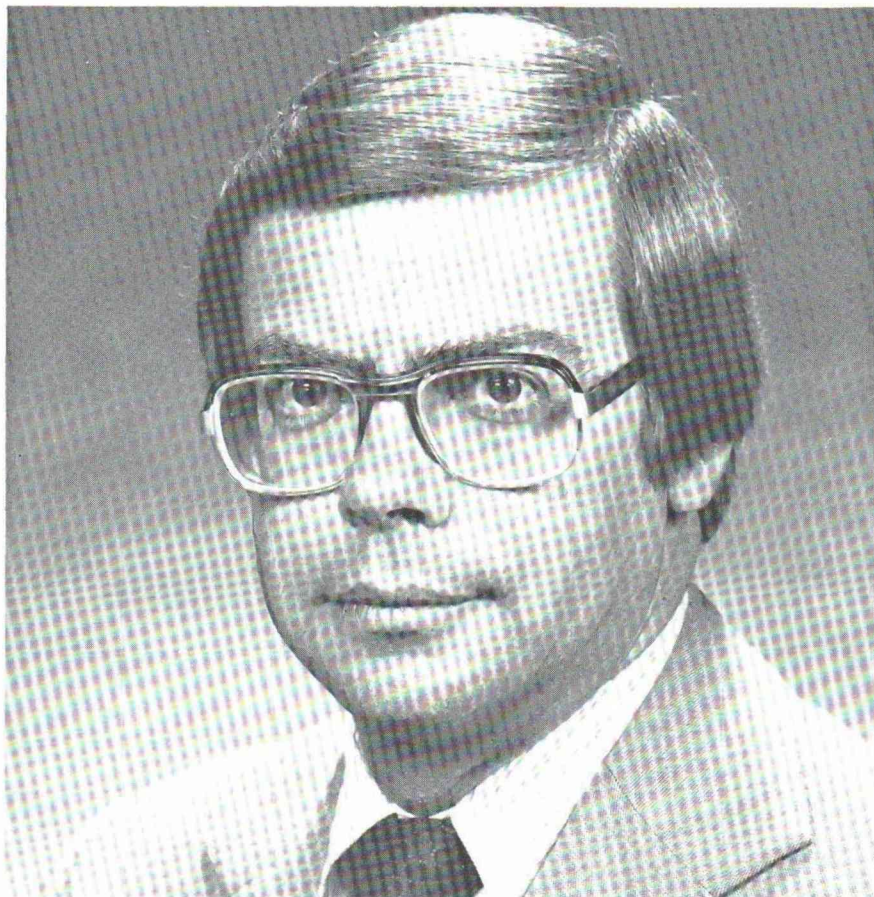
Jon Shirley's exit to Microsoft, the firm behind the Model 100's invisible operating system, will help the enterprise founded by *wunder-kind* Bill Gates and not hurt the Tandy Corporation, where Shirley worked for 25 years, according to market analysts interviewed by *Portable 100*.

Microsoft announced the election of Shirley, 45, as president and chief operating officer last June and assumed the position August 1 (see *Portable 100*, September 1983, page 37). He succeeded Jim Towne, who reportedly left the Bellvue, WA, company because of differences with Gates.

LEFT AMIABLY. Shirley's departure from Tandy appeared to be an amiable one. In a statement released from Microsoft, all the principal players praised the move by the former head of Tandy's computer merchandising division.

Tandy President John Roach said: "Microsoft has offered Shirley a rare opportunity to manage a high growth company in an exciting, embryonic industry. We wish Jon well, and we look forward to working with him and Microsoft in the future."

Chairman Gates observed, "Microsoft will benefit from Jon Shirley's broad understanding of the personal computer business. We've known and worked with him for a number of years, and we are certain Shirley's experience and vi-



Jon Shirley

Bill Gates made him an offer that couldn't be refused.

sion will be a strong complement to our software development expertise."

OFFER OF A LIFETIME. And Shirley added: "The decision to make this career change was a difficult one, but I consider this a once-in-a-lifetime opportunity. I believe Microsoft will lead the industry on the edge of explosive growth. Moreover, I've known and worked with Bill Gates and other Microsoft people, and I'm enthusiastic about joining such a fine organization."

Experts interviewed by *Portable*

100 agreed with Roach and Gates that Shirley would be a significant addition to Microsoft.

"I think Shirley brings a lot of strength to Microsoft," said Aaron C. Goldberg, an analyst with the International Data Corporation in Framingham, MA. "He knows how to run a big company, how to make a big company grow, how to make a big company run profitably."

"Bill Gates is a hell of a guy, but one man can only do so much," Goldberg continued. "He needs someone with the training and background, who isn't going to learn how

to run a company at his expense. Shirley is that kind of guy."

MORE COMPETITIVE. According to Alex Stein, a senior analyst with Dataquest in San Jose, CA, Microsoft, with the hiring of Shirley, "is seeking to move more effectively into retail and mass distribution."

"It will make Microsoft," he continued, "more competitive with Digital Research and other software manufacturers."

Stein explained large software manufacturers are starting to concentrate their attention to segments of the market, rather than treating it as an homogeneous mass. In light of that development, Shirley "will help Microsoft develop more effective horizontal segmentation and vertical segmentation. In this area, someone with the experience of a Shirley can be of real benefit to them."

REORGANIZATION. In the wake of Shirley's exit, Tandy reorganized its computer merchandising division, a move the Fort Worth firm said would "direct more intensive management support to specific TRS-80 computer product segments."

Under the reorganization:

- Ed Juge, with Tandy since 1978, became business computer merchandising director. He will oversee the merchandising of advanced business computers sold in Radio



Bernard Appel

New directors report to him.



New CEO at Source. Bert I. Helfinstein, 49, has become president and chief executive officer of The Source Telecomputing Corporation. Helfinstein is the former president of the Computer Systems Group at Planning Research Corporation, a computer services company in McLean, VA.

Shack computer centers and the company's stores with expanded computer departments.

- Mark Yamagata, with Tandy since 1968 and recently head of the firm's United Kingdom operation, will handle merchandising of Radio Shack's personal computers.

- Bill Wash, a 13-year veteran of Tandy, dons the title director of computer merchandising services. He will be responsible for customer service, software quality assurance, outside software support, computer training programs, and the *TRS-80 Newsletter*.

All the analysts interviewed by *Portable 100* agreed the reorganization would have little impact on how Tandy now conducts business.

TDP SPECTER. However, Shirley's departure from Tandy could slow the Texas firm's entry into retailing outside its company stores — an inevitable move, according to Dataquest's Stein. Tandy's one "experiment" with outside distribution — marketing TDP Color Computer clones through RCA distributors —

was ditched by the company after a lackluster performance.

"It will slow them down in the move toward non-captive retailers," Stein said of Shirley's exit, "but from my point of view it is a forgone conclusion they will have to take advantage of those other retailers to remain competitive."

"Tandy will have to move to non-captive distributors," he contended. "It will be a requirement of the market. They simply can't get enough volume through their retail outlets. It will be important for them to break into department stores and consumer discount outlets, especially in the face of IBM's strength in the business and home markets."

Market trends may have even influenced Shirley's decision to move to Microsoft, Stein claimed. "There is a recognition by marketing people in the industry that the real opportunity in retail is software," he said. "What he is doing is positioning his career to take advantage of that growth. Being with Microsoft, with its strength in MMDOS, puts him in a very good position." ■

TRADE MAG REPORTS 100 DARLING OF REPORTERS

A newspaper trade magazine ran a three-page story on the Times Publishing Company in Erie, PA, buying TRS-80 Model 100s for its "beat" reporters.

"I can see the day coming when every reporter will be assigned a computer of his own to take home in his briefcase at night," the company's Michael Mead told *Editor & Publisher*.

Months before the newest generation of hand-held portables began appearing on the covers of *Popular Science*, *Science Digest*, and other magazines, Mead had bought 100s for his reporters.

Ed Juge, Tandy Corporation's director for business computer merchandising, told *E&P* the newspaper was one of the first in the country to equip its reporters with 100s.

"You can't help but be excited about them," Mead told Jack Grazier in the *E&P* article. "They've led to better writing and better stories getting into the paper. It's easier to write on these things so the writing's better. It's easier to edit stories written on them, so the editing is better."

Already, only weeks after their appearance on the market. Associated Press has bought eight of the portables as an experiment. If the exper-

TIMES OF ZAMBIA
FORWARD WITH THE NATION

Egyptian students keep up their protests



New Paris bid to boost franc

Devaluation is no cure, De Gaulle says in Broadcast



POWER FROM KAFUE PLANT BY 1970



THE GREATEST CAR TEST OF THEM ALL GETS UNDERWAY



SIERRA LEONE GIVES STEVENS POWER OF EMERGENCY



Another U.S. Boeing shipyard



'Why Onassis and Jackie'



TELEPHONE & CO. LTD.



CARPETS CURTAINING LOUNGE SUITES HI-FI EQUIPMENT STOVES REFRIGERATORS OFFICE FURNITURE



iment succeeds, *E&P* reported, the wire service will buy about 20 more of them.

"We'll use them for our people in the field, covering news events, sports events, and the like," said Mike Bakanas, operations manager for the AP in New York. "I think they're really neat units."

The trade weekly reported Gannett Rochester Newspapers is considering buying the Model 100 for its papers, and *Personal Computing Magazine* has already equipped its writers with the Radio Shack portables.

Recently, the magazine said, more than a dozen representatives of various national publications flew to Tandy headquarters to take a look at the 100. "Almost to a person they commented that they would have to have one," Juge said, "that it was absolutely what they had been looking for, and it was the best way to go."

According to author Grazier, low price, small size, large display screen, and large readable typeface have made the 100 the choice of the print media.

"We've found that in notetaking in a courtroom, we pick up a lot more direct quotes with the portables," said Tony Zona, city editor for the *Erie Daily Times*. "And it saves a great deal of time. Now the reporter doesn't have to write notes in longhand and then type them into a story or dictate the story over the phone. His original keystroke is captured and utilized."

Grazier wrote portable computers may make phoning in a story a thing of the past, to the great relief of everyone involved. No more tying

up of two reporters for one story, since the computer eliminates the need for a typist back at the office. No more respelling on the phone for the typist. Addresses and numerals come out in the story exactly the way the reporter types them in. No more V as in Victor and T as in Tom. No more saying "period-paragraph" or comma at the end of a breath.

"A 10 column-inch story now takes less than five minutes to get back to the office, whereas before, it took the office typist, distracted with other things, 10 to 15 minutes," Zona told *E&P*.

"They can carry this thing with them and keep filing stories rather than rushing back to the office to type them or taking somebody else's time in phoning in," Mead added.

And according to Grazier, editors aren't the only members of the Fourth Estate that like the 100.

"They're great," courthouse reporter Vicki Sanfilippo said. "I wouldn't do without mine. It only took about 20 minutes to learn how to use it, and since then, I've shown three other reporters how to use it in the same amount of time."

"Even the tv stations are interested in it," she noted. "At a county council meeting the other night, one of the stations took a long shot of me taking notes on the computer. Everywhere I go, people stop and are fascinated by the way it works and its capabilities."

Grazier wrote that Sanfilippo takes her 100 home at night. If anything news worthy happens, she said, she could always write a story on the spot and send it to the newspaper from her home.

THE DAILY STAR
Quiky

PRESIDENT-POLL IS SET FOR JULY 28

Eahkol Shops For Arms

Shahri Is India's Premier In Unanimous Party Choice

Shukairi to Head PLO Palestine Forum Closes Session

S.E. Asia Defense Pledged by LBJ as Strategy Talks End

Bell to Visit Paris, London

The PROTESTER

Daily Mail

VORSTER'S 'NO' TO M.C.C. TOUR

Nats cheer as Premier slams the door

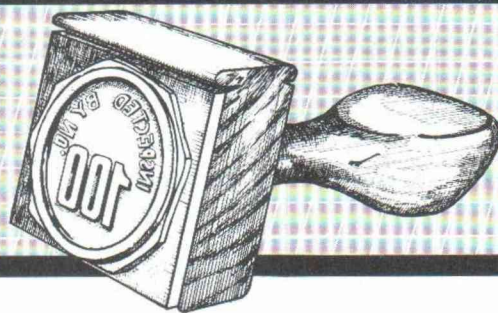
HE SURVIVED SHOOTING — This may be S.A.'s farewell to international sport

R85m pay boost for teachers, public servants

Campan to Ban French Rugby Tour

STOP PRESS

REVIEWS



CONFESSIONS OF A CALC JUNKIE

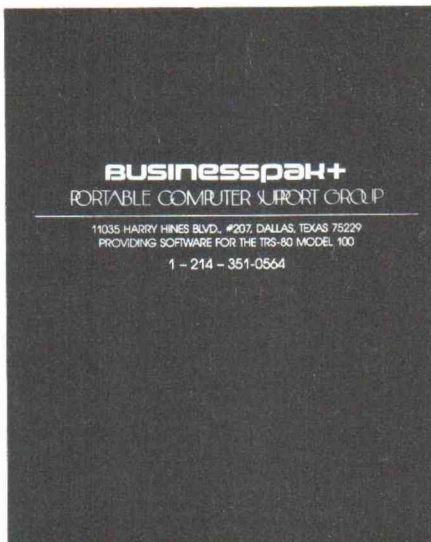
PortaCalc
Skyline Marketing
442 Sunnyside
Wheaton, IL 60187
312-260-0929
\$69.95

Expns+ and Graph+
Portable Computer Support Group
11035 Harry Hines Blvd. No. 207
Dallas, TX 75229
214-351-0564
\$89.95 (for six programs)

By CARL CRAMER

Editor's Note: Just prior to press time, we received word from the Portable Computer Group it had just finished a new version of the Sort+ and Put+ programs in its Businesspak+ package. Although we had a review of the original programs ready for publication, we decided to hold that review and wait for the revised programs. A review of those programs will appear in our November issue.

I must preface these reviews with a bias: I love the calcs: VisiCalc, SuperCalc, 1-2-3, Multiplan... I've tried them all. And then a strange thing happened: The Model 100 came on the scene. I dropped my Osborne and PC, and relinquished my friend's Apple, determined to be content to go online every night and await the arrival of portable spreadsheets. Within hours, they both ap-



peared on my desk: PortaCalc and Expns+. One month later, the Osborne stands at cockeyed attention on the floor; the dust jacket of my PC remains untouched. The Model 100 reigns supreme!

The above is not intended to suggest that either of these programs can — individually — replace the power of existing spreadsheet programs. Where they do succeed is in offering the capabilities of financial forecasting in a truly portable mode.

Last week I was flying to the West Coast and boarded the plane late. Seated in my row was a businessman with a certain smugness about him. Sure enough, the telltale blue of an Osborne case was visible under his seat. I could feel his attention as I unwrapped my Model 100. It wasn't until I called up Expns+ from RAM and started entering my receipts for the day, however, that he actually came to look over my shoulder. "Just updating my travel expenses," I offered, helpfully. It would be euphemistic to term his reaction "crestfallen." However, gameful good sport that he was, I took him through its

paces. Half an hour later, he returned to his seat. I thought I saw him, out of the corner of my eye, give his Osborne the benefit of his heel. I knew how he felt.

NOT ENOUGH RAM! Let me digress just briefly on one significant Model 100 drawback at this juncture, the fourth month of its existence on the open market: not enough RAM (anyone developing portable disk drives?). This shortcoming deprived me of the opportunity to demonstrate, quickly, to my airborne friend the virtues of PortaCalc as well as Expns+. However, I was ashamed at the prospect of pulling out my Radio Shack TRS-80 CCR-81 Computer Cassette Recorder (Radio Shack No. 26-1208) in order to upload my existing Expns+ files to cassette (thus freeing up some vital RAM) and, secondarily, download from cassette my half-completed cash-flow projections on PortaCalc.

I guess these are some of the crosses we Model 100 owners must bear. Without further digressions, let me say a few words about these two programs:

If you can live within the limitations of seven-digit decimal placement and are assiduously committed to spreadsheet analyses while flying 50,000 feet aloft, PortaCalc is for you. It lacks some of the power, speed, and formatting available with the prevailing calcs but once you're familiar with its idiosyncracies and limitations, its ease-of-use and functional application can readily compensate.

Perhaps the chief limitation of PortaCalc is the size of the spreadsheet: 14 columns and 26 rows, for a grid of 364 cells. With any decent-sized, cash-flow analyses or financial

Please turn to page 58

PORTABLE COMMANDER



JAKE BUILDS ANOTHER ROM CATHEDRAL TO THE ART OF REVERSE ENGINEERING

It gets me every time. And for some reason, it's always with Radio Shack computers. (Although the Ataris had me at it once or twice.) It keeps me up into the wee hours, wears down pencils, pencil erasers and erodes my stock of computer stationery. You'd think by now I'd learned the lesson; but no, I had to get hooked all over again. But with 32K of ROM ...am I crazy or something? In case you didn't realize (and if you have an ounce of sanity left, you didn't), I'm talking about disassembling ROMs. In this particular case, the Model 100 is the target.

I'm still not sure why I do it. I feel like some kind of software lemming when I face all those blank sheets of paper and just dive in. Perhaps if I go back to my original experience with the Model I TRS-80 some sense can be made of all of this.

DARK AGES. In the latter half of 1978 (in the dark ages of microcomputing), I returned to England clutching a 16K Level II version of the machine about to surprise the world—including Tandy. After suffering a few hostilities from a bemused customs officer—all in the cause of being a pioneer—I arrived home with what surely must have been one of the first TRS-80s in the United Kingdom.

Another problem with being a pioneer was no software, no printer, and no more money to get them with. It was that printer problem that was the mother of invention.

I got hold of a teletype terminal for about \$35. A bargain printer, but

how the heck was I going to hook it up to the Model I? I felt there had to be a way if only I could find how it was intended to work with a parallel printer. I was naively hoping I'd be able to change *something* that would enable me to use my terminal as a printer. Two weeks of sheer hell followed—including lots of the now familiar burning of that old midnight oil.

First, I knew I'd need to find the LPRINT routine in ROM. That would give me the information I'd need to see how ROM interfaced in general with the line printer. No problem. It'd be as easy as finding a needle in a haystack.

DEAD EASY. All I had to do was write a disassembler and look for a routine somewhere in 16K of ROM. Sure. Dead easy. To write the disassembler of course I'd need to learn how the architecture of the Z80 microprocessor was set up. Then I'd have to write a Basic program to interpret the bytes in ROM from numbers into Z80 opcode mnemonics.

There was still a problem. Where was this disassembly output going to? I hadn't any way of printing it out yet (a software Catch-22). I was faced with the task of writing the disassembler, debugging it, and finding the print routines by video only.

Now this is where serendipity comes in, makes the whole unsavory process worthwhile, and drives me to do it all over again with the Model 100.

Before I found the routine to send characters to the line printer, I stumbled across the routine to print to the

screen. In analyzing this code, I discovered it was possible to commandeer the routine, send it to a subroutine of my own writing, then send those characters to my teletype. I set about doing that until I finally had my first Model I machine-code routine executing without a hitch. Characters went dutifully from the video to my printer at a reckless 10 characters per second.

HOOPS TO HIGH WIRE. Note that as an unintended bonus, writing the disassembler had given me enough knowledge to write native Z80 machine code. You'd think by this time the original intent was satisfied. But no. I'd already gotten the machine jumping through hoops and I wanted it walking a tightrope.

I set my disassembler to plod through the whole 16K of ROM at 10 characters per second. A new tally roll was placed on the printer and a fresh ribbon slotted in. I'd set the whole thing up in my garage in what appeared to be a cathedral of reverse engineering.

I set the works in action and went to the pub expecting it to be more or less finished by the time English drinking-up time was around. My disassembler was slow (it was awful); my printer was even worse.

I returned from the pub realizing my night's sleep would be punctuated by the sound of never-ending carriage returns.

RESTLESS SLEEP. Have you ever run a long program and tried to sleep through it? Every couple of minutes I'd invent a new crash I was certain had just occurred. And surely the printer hadn't done a carriage return for ages. The paper must have run out. No, the printer-ribbon would go first. But it was new. Of course, the paper would jam. It was spewing all over the floor! The midnight oil burned on and on.

Just before noon the next day it came to a successful conclusion. I had what seemed like a mile of badly written disassembly to look at. I chopped it all into page-sized pieces and went at it like a maniac.

Within 48 hours I was picking up speed. Once certain routines had been identified, other routines fell into place. The Model I had given me a brain dump and I'd psychoanalyzed it. I became an instant expert on the machine's workings and gained insights into the hardware that I couldn't have otherwise discovered.

Next, I bought a Color Computer. But that was easier. I had a real printer by that time. All that was required was to learn 6809 machine code and write a disassembler for that. Of course, lots of lost sleep walking through the ROM routines but eventual success. Now I knew the Color Computer inside and out and had gained a knowledge of the 6809 chip. I'd also worn down a million pencils and used at least a gallon of midnight oil per kilobyte.

MODEL 100. Then, of course, the Model 100 arrived. That LCD. How did that work? What about the RS232, modem, telephone dialer, and all that stuff? But no. Please. I couldn't do it all again surely? I'd have to write an 8085 disassembler and print out a whole 32K of ROM mnemonics. It would use reams of paper...

Well, at least I've improved my techniques since the early days. Now the disassembly resides (four inches thick) in a neat and tidy three-ring binder. It also resides on a random-access disk file on my Model III. Tied in with this file is another random-access file containing the comments for each line of machine code.

As well as writing an 8085 disassembler, I now have a program that lets me edit the comment file. Once I find the function of a particular routine, my edit program will do a global search of a whole half megabyte file and automatically comment each occurrence of that routine.

Life is much easier these days. What with a cross-reference file, a sequential memory map file, and a Model III to help me, 32K of naked ROM should be a piece of cake. The 32 gallons of midnight oil in my backyard is just a coincidence. 4

PRACTICAL APPLICATIONS for the MODEL 100

P
R
I
N
T

Provides your Model 100 with enhanced word processing features — Automatic 'new line' eliminates split words at the end of a line, full margin control with right justification, automatic pagination, forced 'new page,' pause between pages, line centering and more!

PRINT \$49.95 cassette

S
I
Z
E

Reads file and calculates length in number of lines and total bytes. Also performs checksum to verify validity of phone transmissions.

SIZE \$19.95 cassette

S
O
R
T

Dual purpose sort program useful for maintaining organized text files such as ADRS.DO & NOTE.DO. Employs simple but effective alpha or numeric sort algorithm.

SORT \$29.95 cassette

C
O
P
Y

Multi-purpose file routing utility allows file merge or duplication. Output may be directed to screen for viewing or to other devices. Very useful in phone communications.

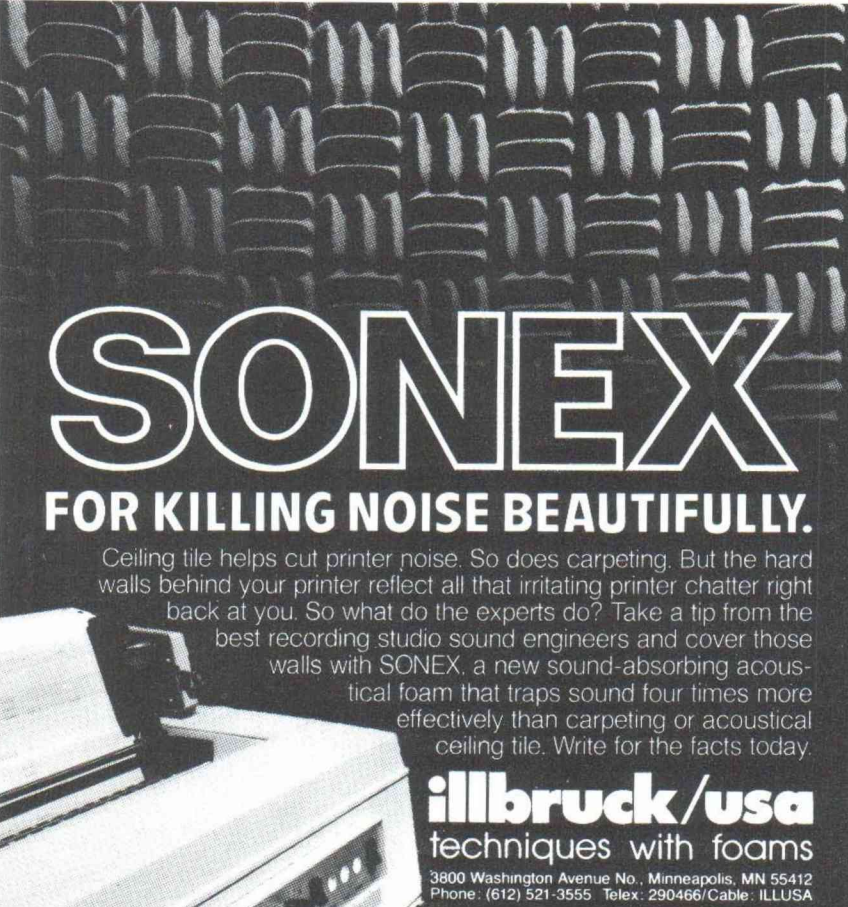
COPY \$19.95 cassette

This is just a sample of what is available from Micro Computer Services. A full catalog will be shipped with every order.

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TANDYTALK



TANDY REORG CLEAVES COMPUTER MERCHANDISING INTO THREE NEW PARTS

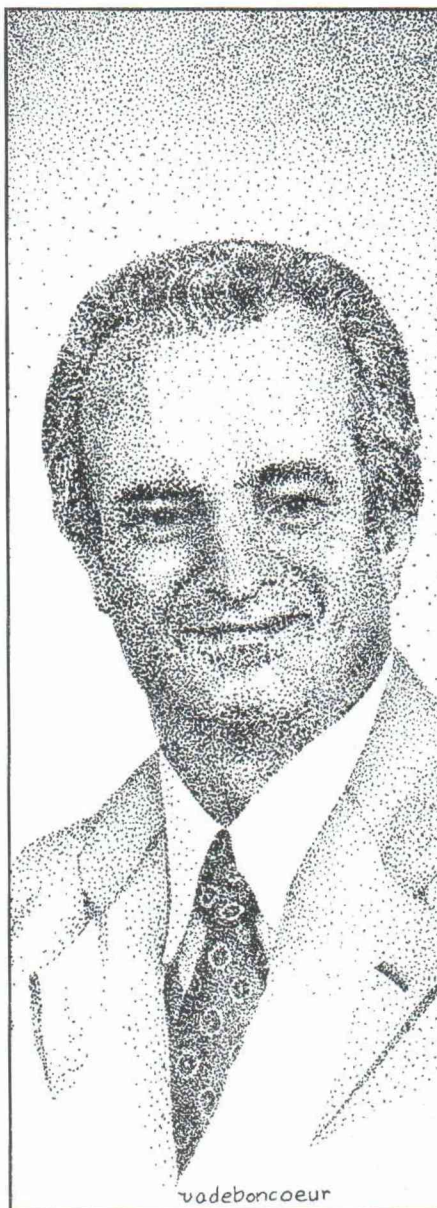
I've been told by my editor I'm not only hard to get by telephone but rotten about getting my column in by deadline. Guilty on both counts.

Last month I described the organization of computer merchandising here at Radio Shack. In an effort to help me out and provide some information to pass on in this column, Radio Shack agreed to re-organize computer merchandising. Actually, they didn't do it just to please me. Jon Shirley, vice-president for computer merchandising, decided to leave to be president and chief operating officer at Microsoft (see related story on page 14). As a result, the department as I described last month doesn't exist anymore.

Computer merchandising has been divided into three segments. They are computer products support, business computer products and personal computer products merchandising.

NEW FACES. The support segments, computer center training, *TRS-80 Newsletter*, outside software support, and software quality assurance will all come under Bill Wash. Bill has been with Radio Shack for 13 years and most recently was director of computer customer services. He retains direction over customer services and the added segments will allow better focus in all areas of customer support.

Ed Juge is now the director of merchandising for business computer products. He will be directing the efforts of our software product planners as well as the three buyers



Ed Juge
New head of business computers.

covering the Models 12, 16, and major peripherals. Ed was previously director of computer merchandising.

Mark Yamagata is director of merchandising, personal computer products and directs the three buyers watching over the Pocket Computer, Color Computer, Model III/4, Model 100, and general accessories.

This new organization will allow us to spend our most precious talent (people) better. We believe the overall result will be better products for our most precious asset: you, our customer.

NEW PRODUCTS. I've gotten a number of letters from people asking, "What book do you recommend on Basic for the Model 100?" Well, up to now, I've had to be pretty general and point to our *Getting Started on the TRS-80* designed for our Model III ROM-based system. It didn't cover any of the Model 100's special commands such as ON MDM GOSUB, ON TIME\$ = GOSUB, and others.

For those of you who would like such an item, I have some good news. The *Model 100 Basic Language Lab* (26-3821, \$29.95 suggested retail) is for you. It has 15 chapters packed with information and starts out assuming you don't know one single word of Basic. There are dozens of examples in each chapter and you'll enjoy most of them. Also included is a cassette tape with three large sample programs explained in the text.

Stop by and take a look if it sounds interesting. I think you'll like it!

NEW TECHNICAL INFORMATION. We have said for several months, "Yes, we are going to document the Model 100 ROM in a similar fashion to what we did for the Model III." The wait is finally over and the in-

formation is available as close as your local Radio Shack store. Ask your local store to order for you 700-2245. It has a great deal of information about the input-output (I/O in computer terms) of the Model 100 and is a *must* for anyone wanting to do any machine-language programming. This is not a technical reference manual; it is information on calling machine-language subroutines contained in the ROM Routines such as:

- LCD: Display a character on the LCD at the current cursor position. Entry Address: 4B44H. Entry Conditions: A = character to be displayed. Exit Conditions: None.
- SETCUR: Set cursor position to specified location. Entry Address: 7440H. Entry Conditions: D = column number (1 to 40). E = row number (1 to 8). There are no exit conditions.

As you can see, we're not trying to make machine-language programmers out of anyone, just trying to pass on the information for those who want to use it.

NEWSLETTER. Speaking of passing it on, if you own a Model 100, did you get a letter from us telling you this information was available? If not, that means you didn't send in your blue newsletter registration card packed with each Model 100. We used this list to mail out letters letting everyone know the documentation was available. We know we missed some people since our last count shows about half of the owners have not sent in their cards.

This card gets you two things. First, a six month free subscription to the *TRS-80 Microcomputer News*. The newsletter has grown over the years and is now 48 pages, complete with color, and contains the latest information about Tandy products.

The second thing it does is put you on a computerized list as a Model 100 owner. We will use this list should it be necessary to notify Model 100 owners about some change or important update. If you didn't get a card with your Model 100 make a copy of your sales receipt that clearly shows your purchase date and address. Send it to Newsletter Registration, P.O. Box 2910, Ft. Worth, TX 76102-2910. You'll be put on the list and your subscription started. 📧



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BUSCH LEAGUE



AN ANCIENT STRATEGY GAME OF ROCK, SCISSORS, PAPER DONS SILICON CLOTHING

Editor's Note: Dave's columns are based on Break Time: 25 Games for Your TRS-80 Model 100, a book he is preparing. Although he has written nearly 300 articles on computer-oriented topics in the last nine years, Dave is probably best known as the creator of the fictitious "Kitchen Table, Inc." Word has it the KTI crew is hard at work developing a telecommunications program for the Model 100 having nearly all the features of TELCOM.

Dungeons and Dragons games are very popular, due to their fantasy element. Players assume the guises of wizards, warriors, trolls, and other people from normal walks of life.

Because D & D games require the extensive study of lore, martial arts, and other fields, I decided not to include one in this book. However, if you can imagine yourself as an anthropomorphic Paper, a living Rock, or a menacing magical pair of Scissors, you can get some of the fun of Dungeons and Dragons from this program.

After all, like D & D, each character has its own set of attributes and hidden weaknesses. The mighty Paper is capable of smothering some of its enemies, although it can be slashed to ribbons by the vicious Scissors. The Rock, while susceptible to attacks by Paper, is capable of smashing Scissors to death. All cut-and-dried, right?

TOO VIOLENT. The only problem with Paper, Rock, Scissors cum D &

D is it might be too violent for some. After all, you won't see smothering, hacking to pieces, or stoning to death on prime time television.

Although PRS is longer than some games, it is very simple. Most of the length comes from writing similar routines to take care of all the possible permutations of player and computer choices.

The player selects first, inputting either "P, R or S" in line 310. The computer chooses next.

CHEATING MICRO. Computer neophytes may be a bit suspicious here. Allowing the computer to choose its weapon after the player has entered a choice leaves the game wide open for computer cheating. Those who know computers better, though, know better.

The computer makes its selection in line 340 by taking a random number from 1 to 3. This selection has nothing at all to do with the value of

A\$. I know. I checked. Distrusting types can move line 340 up to before the player makes a choice. For this tactic to work, however, you will have to renumber it. A line number like 305 would be appropriate. It will be necessary to change line 350's number to 340, however, because the program jumps to 340 from line 320. Aren't you ashamed for causing all that trouble?

Each of three major routines are built around the computer's choice, e.g. Paper, Rock or Scissors. Within each of those routines are three sub-routines, based on the player's choice, which handle whether or not you won, lost, or tied. You get a point for winning; the computer gets a point when it wins. Nobody gets point when both choose the same weapon.

That's all there is to it. The computer's points are stored in variable CP. The person's points are stored in variable PP. Whichever reaches 15 points is declared the winner.

Don't try using psychology on the computer, though. Thinking "It'll never guess I'm going for Rock, because I went for Rock three times in a row already!" will have no real bearing on the game's outcome. ♣

LIST OF VARIABLES

AS Used in INKEY\$ loop
CH Computer choice
CP Computer's points

DU Dummy variable for RND(1)
N Loop counter
PP Person's points

*See p. 4 for an explanation of Portable 100's program listing format.

```

30: * PAPER, ROCK, SCISSORS *
40: ***
50: *****
55: *** INSTRUCTIONS ***
60: CLS
   :PRINT
   :PRINT
70: PRINTTAB(2) "Do you want instructions?"
80: PRINTTAB(12) "(Y/N)"
90: AS=INKEY$
   :IF AS=" "GOTO90
100: IF AS="Y"OR AS="y" GOTO120
110: GOTO170
120: CLS

```



```

:PRINT
:PRINT
130 PRINTTAB(2) "Try to beat the computer to"
140 PRINTTAB(2) "fifteen points by selecting"
150 PRINTTAB(2) "paper, rock, or scissors wisely."
160 PRINT
:PRINTTAB(14) "Good luck!"
165 '*** Set random seed ***
170 FOR N=1 TO VAL(RIGHT$(TIMES$,2))
180 DUM=RND(1)
190 NEXT N
200 PRINT
:GOTO220
210 CLS
:PRINT
:PRINT
220 PRINTTAB(5) "= Hit any key to continue. ="
225 '*** Display Choices ***
230 AS=INKEYS
:IF AS=""GOTO230
240 IF CP>14 OR PP>14 GOTO1010
250 CLS
:PRINT
:PRINT
260 PRINT
:PRINTTAB(5) "You: ";PP;TAB(20); "Computer: ";CP
270 PRINT
:PRINTTAB(8) "[P]aper"
280 PRINTTAB(8) "[R]ock"
290 PRINTTAB(8) "[S]cissors"
300 PRINT
:PRINTTAB(5) "Select: ";
310 AS=INKEYS
:IF AS=""GOTO310
320 IF AS="P"ORAS="p"ORAS="R"ORAS="r"OR
AS="S"OR
AS="s"GOTO340
330 GOTO310
335 '*** Computer makes choice ***
340 CH=INT(RND(1)*3)+1
350 ON CH GOTO360,580,800
355 '*** Computer chose Paper... ***
360 CLS
:PRINT
:PRINT
370 PRINTTAB(5) "Computer chose Paper"
380 PRINTTAB(5) "You chose ";
390 IF AS="P" OR AS="p" GOTO420
400 IF AS="R" OR AS="r" GOTO460
410 IF AS="S" OR AS="s" GOTO520
415 '*** ...and Player chose Paper ***
420 PRINTTAB(5) "Paper."
430 PRINTTAB(5) "Tie. No points."
440 PRINT
450 GOTO220
455 '*** ...and Player chose Rock ***
460 PRINTTAB(5) "Rock."
470 PRINTTAB(5) "Paper wraps Rock."
480 PRINTTAB(5) "Point for Computer."
490 CP=CP+1
500 PRINT
510 GOTO220
515 '*** ...and Player chose Scissors ***
520 PRINTTAB(5) "Scissors."
530 PRINTTAB(5) "Scissors cut Paper."
540 PRINTTAB(5) "You get one point."
550 PRINT
560 PP=PP+1
570 GOTO220

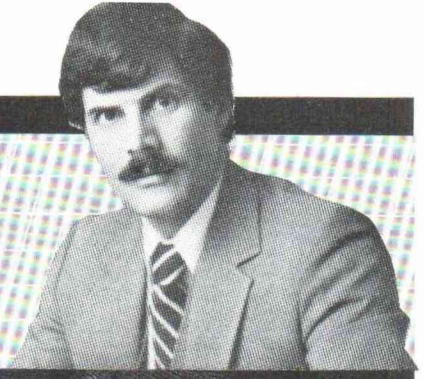
```

```

575 '*** Computer chose Rock... ***
580 CLS
:PRINT
:PRINT
590 PRINTTAB(5) "Computer chose Rock"
600 PRINTTAB(5) "You chose ";
610 IF AS="P" OR AS="p" GOTO640
620 IF AS="R" OR AS="r" GOTO700
630 IF AS="S" OR AS="s" GOTO740
635 '*** ...and Player chose Paper ***
640 PRINT "Paper"
650 PRINTTAB(5) "Paper wraps Rock."
660 PRINTTAB(5) "You get one point."
670 PP=PP+1
680 PRINT
690 GOTO220
695 '*** ...and Player chose Rock ***
700 PRINT "Rock"
710 PRINTTAB(5) "Tie. No points."
720 PRINT
730 GOTO220
735 '*** ...and Player chose Scissors ***
740 PRINT "Scissors"
750 PRINTTAB(5) "Rock breaks Scissors."
760 PRINTTAB(5) "Computer gets one point."
770 CP=CP+1
780 PRINT
790 GOTO220
795 '*** Computer chose Scissors... ***
800 CLS
:PRINT
:PRINT
810 PRINTTAB(5) "Computer chose Scissors"
820 PRINTTAB(5) "You chose ";
830 IF AS="P" OR AS="p" GOTO860
840 IF AS="R" OR AS="r" GOTO920
850 IF AS="S" OR AS="s" GOTO980
855 '*** ...and Player chose Paper ***
860 PRINT "Paper."
870 PRINTTAB(5) "Scissors cut Paper"
880 PRINTTAB(5) "Point for computer."
890 CP=CP+1
900 PRINT
910 GOTO220
915 '*** ...and Player chose Rock ***
920 PRINT "Rock."
930 PRINTTAB(5) "Rock breaks Scissors."
940 PRINTTAB(5) "Point for you."
950 PP=PP+1
960 PRINT
970 GOTO220
975 '*** ...and Player chose Scissors ***
980 PRINT "Scissors."
990 PRINTTAB(5) "Tie. No points."
1000 GOTO220
1005 '*** End of Game ***
1010 CLS
:PRINT
:PRINT
1020 PRINTTAB(2) "Fifteen points achieved!"
1030 IF CP>14 THEN PRINTTAB(2) "Computer wins!"
1040 IF PP>14 THEN PRINTTAB(2) "Human wins!"
1050 PRINT
:PRINT
1060 PRINTTAB(8) "Play again?"
1070 AS=INKEYS
:IF AS=""GOTO1070
1080 IF AS="Y" OR AS="y" THEN RUN
1090CLS

```


TELECOMPUTING



WINGING ACROSS AMERICA MADE EASIER WITH CIS ELECTRONIC AIRLINE GUIDE

The Official Airline Guide Electronic Edition is a valuable tool for frequent travelers. The guide is available through CompuServe and remarkably easy to use.

The guide lists all direct flights operating throughout the world and contains flight schedules for thousands of cities. It contains 700,000 flight schedules for 650 airlines in its data base and daily fare information for North American flights. International fares will be available by mid-1984.

WORTH YOUR TIME. You must still actually make your reservations through the airline or a travel agent. But the ability to choose your own schedule and select today's best fare is well worth your time.

To access the the guide on CompuServe, enter GO OAG at any prompt. Your screen will display:

```
OAGEE Page OAG-1
Official Airline Guide EE 1.
How to use OAG EE
2. OAG EE Feedback
3. Accessing OAG EE
OAG Help Desk: 800-323-4000
Last menu page. Key digit 1
or M for previous menu.
```

Figure 1.

Select option 3 and you will be connected to the the guide. Its rates are \$21 per hour during standard hours (6 p.m. to 5 a.m.) and \$32 per hour during prime hours (5 a.m. to 6 p.m.).

The guide is ideal for the Model 100 because its data is formatted for 40-character screens.

COMMANDS. The guide's basic commands are: /S for schedule information, /F for fare information, /Q to quit and return to CompuServe, and /M to return to the top menu. You may also enter a question mark at any prompt to receive help.

The dialog on the guide is straightforward. Let's say I wanted to schedule a trip between Columbus, OH, and New York City, NY on the fifth of October.

First, I would enter /S for schedule information. The guide would respond with: ENTER DEPARTURE CITY NAME OR CODE. You may enter either the city name or the three letter airport code. If the city name is ambiguous, the guide will provide a list of city choices. For example, I entered Columbus but not Ohio. The guide displayed these choices:

```
YOUR REQUESTED CITY IS NOT
UNIQUE. USE LINE NUMBER TO
SELECT CITY NAME OR
AIRPORT NAME FROM THE LIST
BELOW.
1 COLUMBUS,GA,USA
2 COLUMBUS,GA,USA/
FT.BENNING STATION
3 COLUMBUS,MS,USA
4 COLUMBUS,NE,USA
5 COLUMBUS,OH,USA
ENTER +, -, LINE NUMBER OR
CITY NAME.
```

Figure 2.

Easy so far. I entered five for Columbus, OH, and the guide prompted: ENTER DESTINATION CITY NAME OR CODE. This time I entered the airport code for La Guardia (LGA). The guide prompted:

```
ENTER DEPARTURE DATE OR
ENTER + TO USE 19 JUL 7 OCT
```

Figure 3.

If you want to use the current date all you have to do is press enter. I entered 5 October. The guide finally asked for my desired time of departure.

```
ENTER DEPARTURE TIME OR
ENTER + TO USE 600AM 5PM
```

Figure 4.

The time may be entered in a variety of formats. I entered 5PM but 1700, 500P, or 5P would have been accepted as well.

FLIGHT INFO. In a few seconds, the guide began printing the information in figure 5.

```
FARE MENU
DIRECT FLIGHTS WED-05 OCT
FROM-COLUMBUS,OH,USA
#TO-NEW YORK,NY,USA/LA
GUARDIA
NO EARLIER DIRECT FLIGHT
SERVICE
1 700A CMH 828A LGA TW 112
72S B O
2 140P CMH 300P LGA AL 398
D9S O
3 550P CMH 720P LGA TW 594
72S D O
4 710P CMH 1000P LGA AL 206
D9S 1
NO LATER DIRECT FLIGHT
SERVICE
ENTER + FOR CONNECTIONS
ENTER CX,X#,F#,RS (# = LINE
NUMBER)
```

Figure 5.

The menu gave me several flights scheduled for October 5. I choose the closest to 5 p.m. and selected option 3. One of the guide's nicer features is you don't have to decipher all the coded information. By entering X3, the data would be displayed in English.

EXPANDED DIRECT FLIGHT
DISPLAY
LEAVE- 5:50P ON-05 OCT
FROM-COLUMBUS,OH,USA
TRANS WORLD AIRLINES FLIGHT
594
AIRCRAFT-BOEING 727
CLASS-FIRST/COACH/
ECONOMY
ARRIVE- 7:20P
ON-05 OCT
AT-NEW YORK,NY,USA/LA
GUARDIA
ELAPSED TRAVEL TIME 1H 30M
ENTER S TO RETURN TO
SCHEDULES
ENTER F FOR SELECTED FARES

Figure 6.

BEST FARE. It was that easy to select a flight, but would it be that easy to find the best fare? I ventured on and entered F for fare information. The guide guarantees the fare information to be accurate only on the day of your inquiry. So if you find an appropriate fare, you should call and make reservations the same day. The guide data base promptly printed the fares available for my flight.

FARES IN US DOLLARS WED-05
OCT
SELECTED FOR CMH-TW 594
LGA
ONE-WAY RND-TRP ARLN/
CLASS FARECODE
NO LOWER FARES IN
CATEGORY
1* 35.00 70.00 TW/M MLGA67
2* 98.00 TW/B BWE70
3* 174.00 TW/B BXE70
4* 96.00 192.00 TW/M
MLGA1TO5
5* 199.00 TW/B BE77A
6 130.00 260.00 TW/M M
7 174.00 348.00 TW/Y Y
8 241.00 482.00 TW/F F
* ENTER L# TO VIEW
LIMITATIONS
ENTER L#,X#,S,RS (#=LINE
NUMBER)

Figure 7.

I had a range of round trip prices from \$70 to \$482 for first class. First I tried the lowest fare and selected line 1.

CMH-NYC TW CLASS M WED-05
OCT
70.00 US DOLLARS ROUND-TRIP
LIMITATIONS FOR FARE CODE
MLGA67
FARE DESCRIPTION: COACH
FARES
BOOKING CODE: M.
FARE IS ONLY AVAILABLE FOR
TRAVEL FROM SAT THRU SUN.

APPLIES TO/FROM LAGUARDIA
AIRPORT ONLY.
* END OF LIMITATIONS DISPLAY
ENTER S TO RETURN TO SCHEDULE
DISPLAY

Figure 8.

This fare, although the lowest, was not good on my Wednesday flight so I decided to try another.

CMH-NYC TW CLASS M WED-05
OCT
192.00 US DOLLARS ROUND-TRIP
LIMITATIONS FOR FARE CODE
MLGA1TO5
FARE DESCRIPTION: COACH
FARES
BOOKING CODE: M.
FARE IS ONLY AVAILABLE FOR
TRAVEL FROM MON THRU FRI.
APPLIES TO/FROM LAGUARDIA
AIRPORT ONLY.
* END OF LIMITATIONS DISPLAY *
F TO RETURN TO FARE DISPLAY
ENTER S TO RETURN TO SCHEDULE
DISPLAY

Figure 9.

Well the fare wasn't the lowest, but it was good enough for me. And the savings more than made up for the connect time spent on the guide. Average costs for a typical search range from \$2 to \$5.

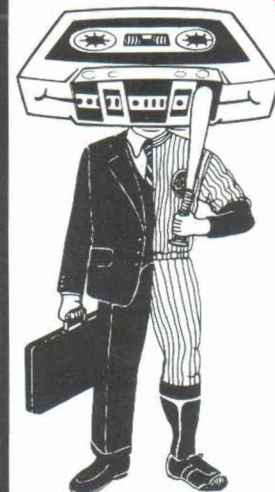
ONE LINE. Once you are familiar with the data base, you may even make your request on one line. For example, I could have simply entered /S CMH; LGA 5 OCT 5P.

The single line entry format is: /S XXX;YYY DD MMM TT, where XXX = departure city or airport, YYY = destination city or airport, DDMMM = departure date (day, month), and TT = departure time. The departure and destination cities must be separated by a semicolon.

To exit the the guide enter a /Q and you will be reconnected to CompuServe.

OTHER INFO. For the more sophisticated traveler, there are other commands for examining connecting flights, return service, and other fare information.

Assistance in using the OAG Electronic Edition is available by calling the OAG EE Help Desk at 1-800-323-4000; in Illinois, 1-800-942-3011. If you wish subscription information contact: CompuServe Incorporated, Information Service Division, 5000 Arlington Centre Blvd., Columbus, OH 43220, or call 800-848-8199 (in Ohio call 614-457-0802).



All
work &
no play
makes
Jack
a dull
boy...

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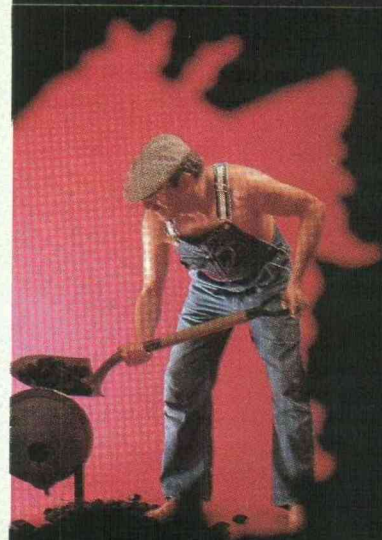
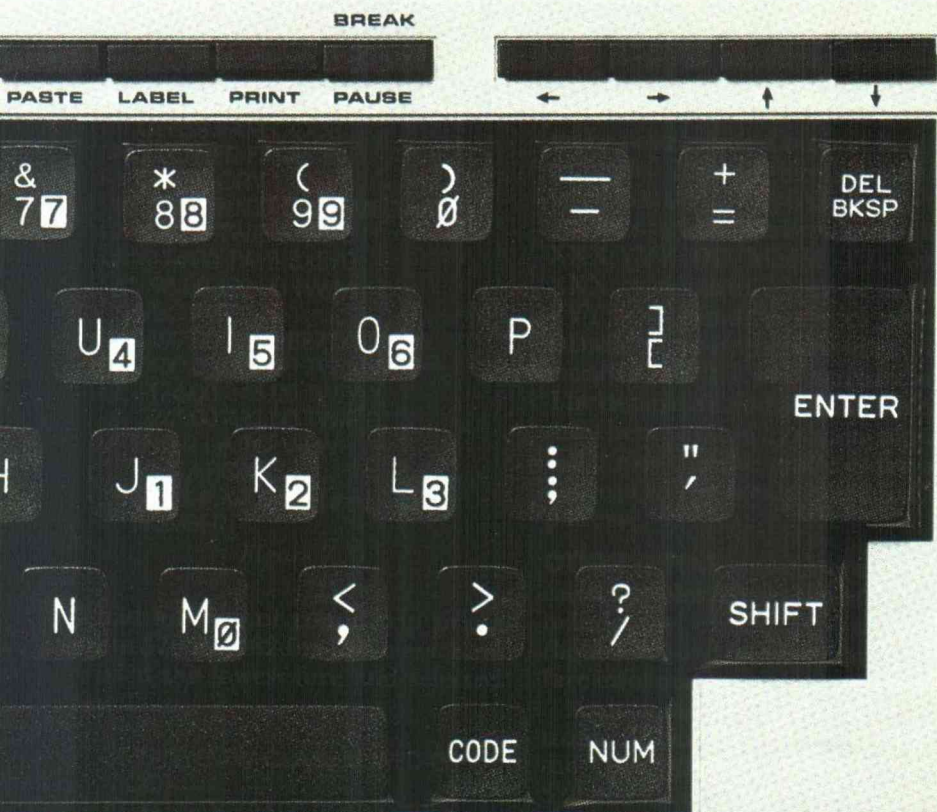
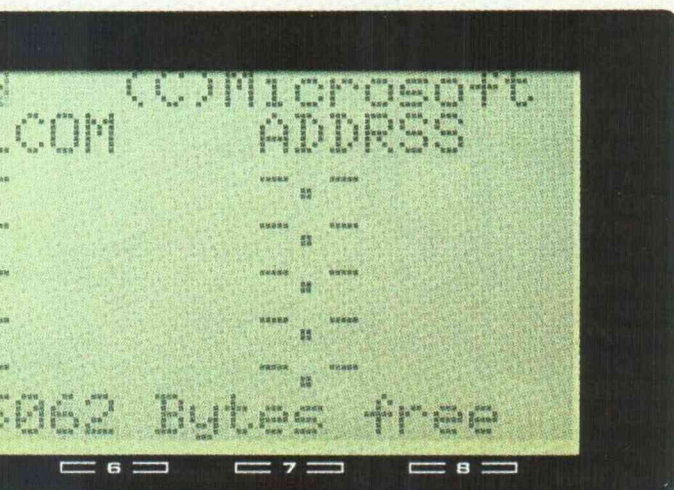
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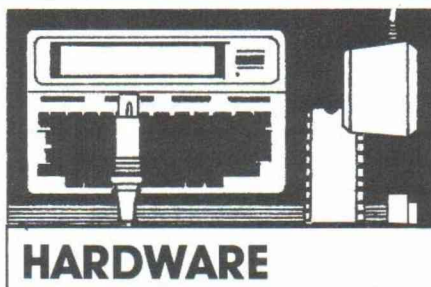
When the price of batteries wears thin the bliss of true portability, take heart! There are alternatives to expensive AAs.

By CHARLEY FREIBERG and CURT FEIGEL

Your M100 is a wonderful buy with its low price and advanced capabilities. Most peripheral devices now available and those soon to be on the market reflect the philosophy of keeping things affordable. There is one item, unfortunately, that could cost you a small fortune through the years—batteries: the one part of the machine that makes it exciting and innovative, and was probably the main reason you bought it.

But there are alternatives to the expensive, short-lived alkalines.

The simplest and most readily available battery replacements are nickel cadmium (nicad) batteries. The Model 100 uses four, AA-sized batteries. Alkaline batteries cost around \$3 for a set of four. A set of two nicads from Radio Shack, catalog number 23-125, cost approximately \$4.39. You can also get nicads in AA size from a number of electronic supply and surplus houses, including Electronic Supermarket, POB 619, Lynnfield, MA 01940, 617-532-2323; John J. Meshna Jr., Inc., 19 Allerton St, Lynn, MA 01904, 617-595-2275;



and Technical Electronics Corporation, 27 Gill St, Woburn, MA 01801. Prices range from 80 cents to \$1.25.

CHARGERS. Along with the nicads, you'll need a charger. It costs \$6.95 from Radio Shack, catalog number 23-133. This charger will hold up to four batteries at one time. Chargers similar to the Radio Shack version are also available from surplus and supply companies selling nicads, and prices from the surplus places are cheaper. Read the instructions coming with your batteries to ensure you charge them properly.

How do you use nicads? Simply pop them in the battery —holder, following the proper polarization instructions. (Make sure the + and — ends of the battery are facing the

right way. There are marks in the battery holder that show you how to do this.)

Now for some painless technical information. Your Model 100 consumes about 60 milliamps per hour, without any peripherals attached—no matter what you may be doing with it. Nicads deliver about 125 milliamp hours of juice. Therefore, a full charge on the nicads will give you approximately two hours of use before you have to recharge them. Since many of you use your 100 for long periods of time, it makes sense to have an extra set of four batteries charged and ready. According to Radio Shack's manual, provided with the Model 100, alkaline batteries will deliver 20 hours of power before they expire. Nicads can be recharged for years before they wear out.

GEL BATTERY. There is another battery available that is rechargeable, cheap, and can be used for an incredible length of time between charges—a gel battery.

A gel battery contains a lead-acid mixture suspended in a gelatinous base. It is somewhat similar to a car battery, but because of the gel, the battery can be placed on its side or upside down or jammed in a pocket without any problems.

The Elpower, 6-volt, 9-amp-hour, solid gel battery will provide about 180 hours of use between charges. The Elpower battery (and similar batteries) are available from the

same sources we mentioned earlier. The average price for the battery and charger is \$19.88.

The only drawback is the Elpower measures 4-inches wide by 2 5/8-inches deep by 5 1/2-inches high. It weighs about six pounds, so it doesn't quite fit into the 100. However, it is easy to hook one up to the computer.

GEL HOOKUP. Go to your local Radio Shack and buy a package of two coaxial adapter plugs, catalog number 274-1551, for \$1.69. You only need one, but keep the other one handy. You'll also need a couple of alligator clips and some insulated wire. Cut two pieces of wire long enough to reach from the battery to the computer. This depends on

where you place the battery and computer during regular use.

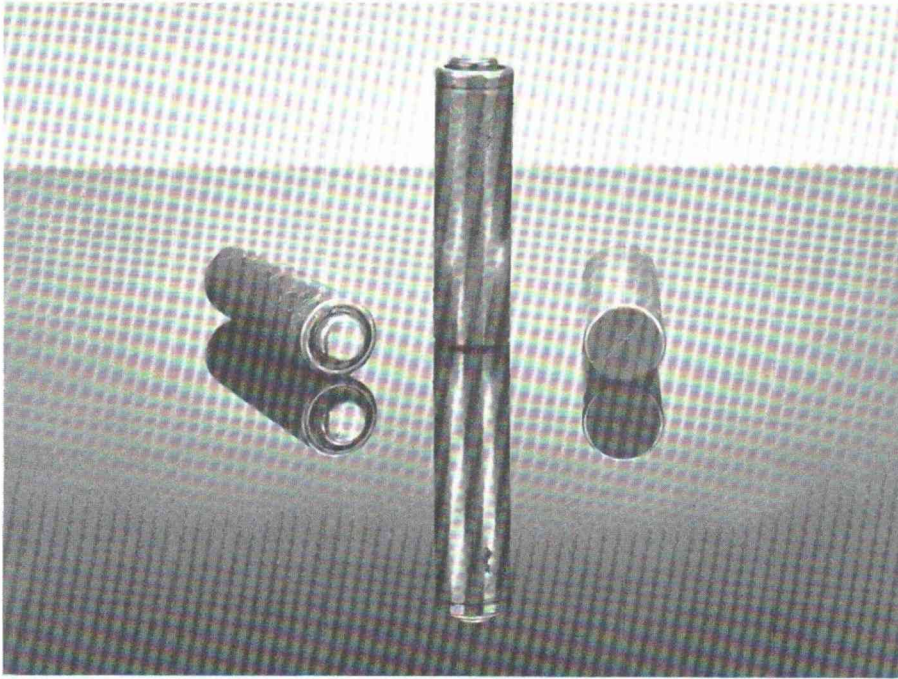
Strip about 1/8-inch of the insulation from the end of one of the pieces of wire and solder the wire to the clip. Solder the other (stripped) end of the wire to either solder joint on the coax connector. Strip the ends of the other piece of wire, and solder one end to another alligator clip and the other end to the remaining solder joint of the coax connector. Keep track of which clip goes to which solder joint of the connector. The clip connected to the short center post joint is the negative terminal. The longer joint connected to the outside body of the coax connector is the positive terminal.

To use the battery and newly made cable, attach the appropriate clips to the battery posts and plug the coax connector into the jack that reads "DC6V" located on the right side of the computer. Turn the 100 on and get ready for a long day.

RECHARGE. When it comes time to recharge your Elpower gel battery, just plug the battery into the charger that comes with the battery. You may have to make a cable similar to the one used to connect the battery to the computer for the charger.

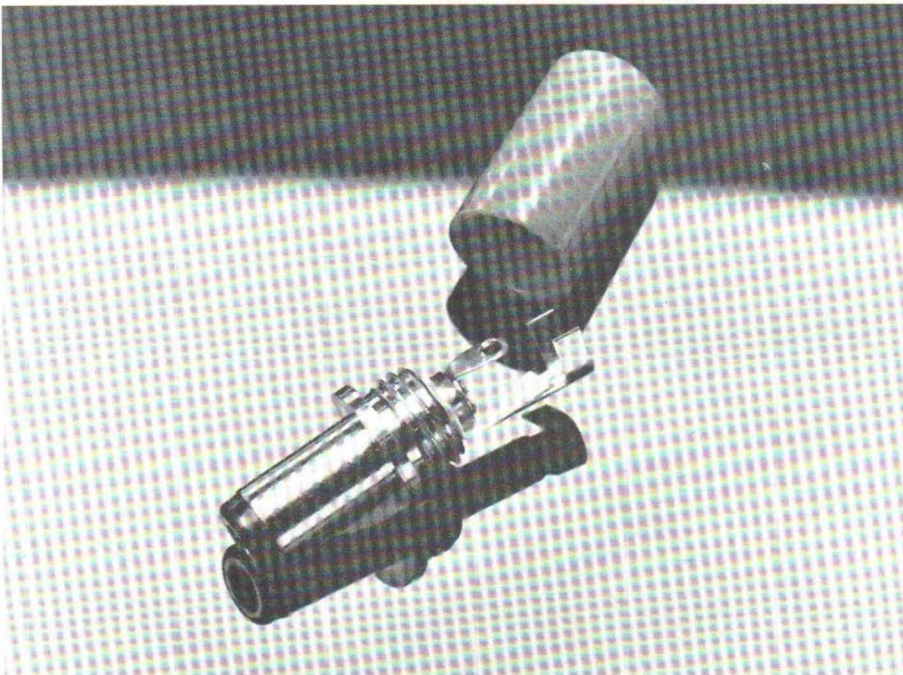
A nice thing about the Elpower battery is you could power the computer and a small light at the same time. If your house power goes out and you lose your lights, there is no way to see the LCD display on the 100. The LCDs require reflected light to be useful, so just hook up the big battery to your flashlight or other small light and work the night away. You'll probably have to make a couple of cables with alligator clips at both ends. Attach one end of each wire to the battery and then experiment to find the way to attach the other ends to a battery powered lamp or flashlight.

There is another kind of external battery that delivers a lot of power for a small amount of money. That battery is the gel cell. Gel cells are rechargeable, about the same size as standard D-cell batteries, and deliver 2 volts at 2.5 amp-hours of service before they need recharging. They come in packs of three, already wired, so all you have to do is solder the wires to a coax connector to hook into your computer. A set of three



Nickel Cadmium Batteries

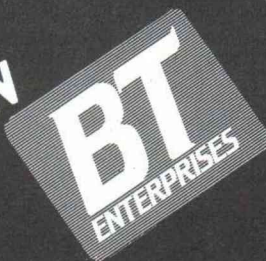
These AA nicad cells show the positive end (battery on left) and the negative end (battery on right).



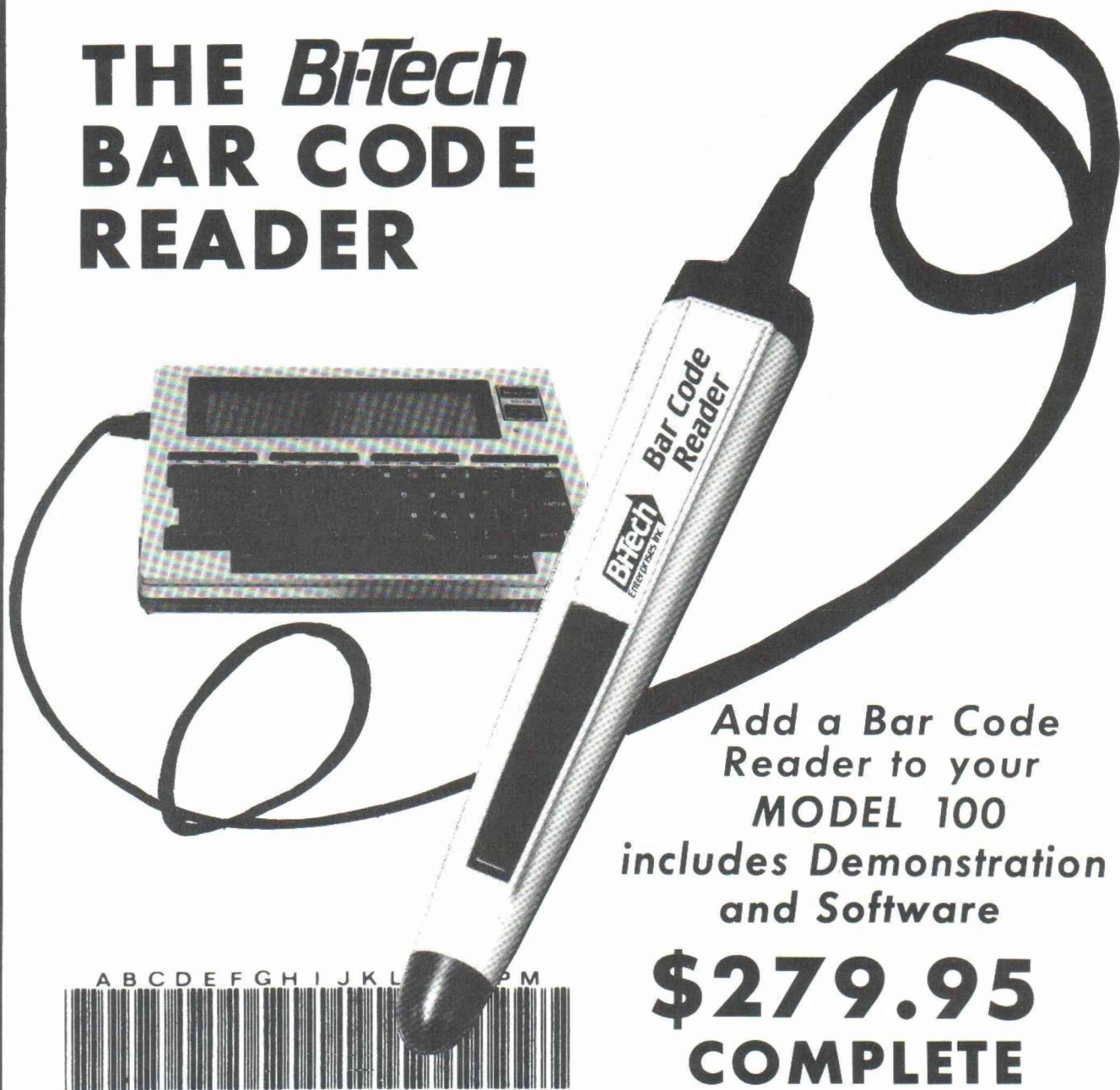
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For connection to the model 100, the short center post is the negative terminal and the longer one is the positive post.

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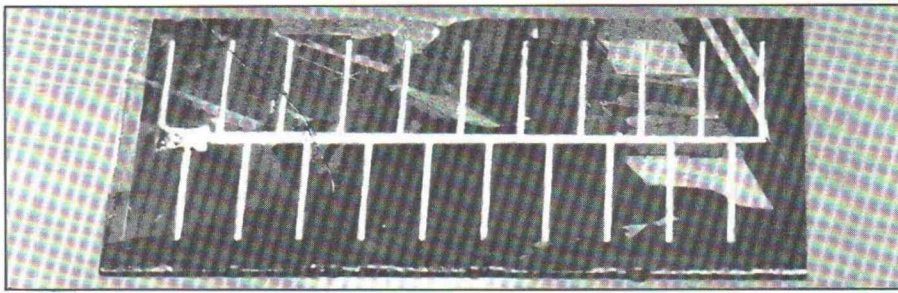
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Solar Cell from Tandy

gel cells will work for 50 hours or so before they need recharging.

One important point: Never deplete the entire charge in nicads or gel cells; it does nasty things to the batteries.

SOLAR CELLS. One final item: solar cells. You don't have to spend anything after the initial purchase of the solar cells, just leave them in the sun or any bright area and keep on typing. Or, hook them into your gel cells or nicads and use the solar cells to recharge the batteries. Solar cells can be purchased at Radio Shack stores (catalog number 276-124, \$3.95) or at most surplus and supply stores. Prices for solar cells range from \$1.50 to \$1.75 for 120 to 150 milliamp cells at supply houses. This is a peak rating, higher than the average output. You need a very bright source of light to reach these ratings.

If you happen to get cells without instructions, wiring is simple. The

underside of the cell (solid soldering pad) is the positive side, so just solder a wire anywhere on that pad. Use fine wire no. 26 or thinner and a soldering iron rated at 50 watts or less. To use as a charger, solder the wires to the solar cells and solder each loose end to an alligator clip. clip the + lead to the + post of the battery and the - lead from the charger to the - post of the battery. The top, negative side has wiring pads to solder onto. Solar cells deliver .45 volts per cell and 100 milliamps per square inch of cell area.

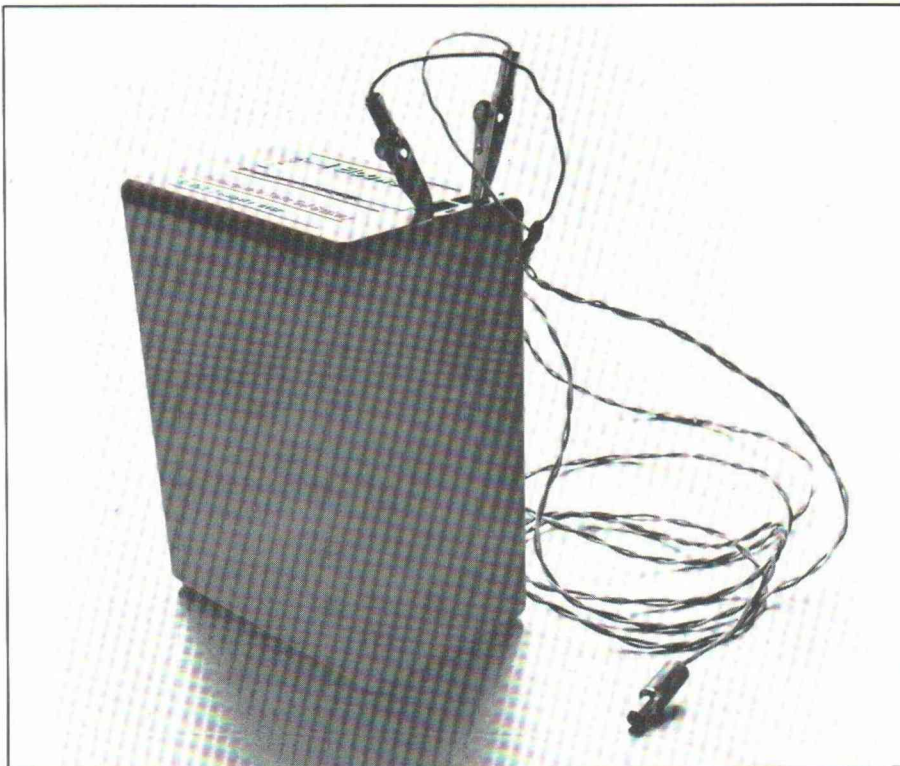
In order to get 6 volts out of the cells, you'll have to solder about 14 of them in series. To do this, solder a wire from one cell's positive side to the next cell's negative side. Take the second cell's positive side and solder this to the third cell's negative side, and so on. The 14th cell will have one positive-side wire loose and the first cell will have its negative

wire loose. These wires go to the coax connector. Set the cells in the sun and go to work.

POWER GAMES. An interesting note about the power arrangement in the 100: If you are using an external power supply plugged in to the 6-volt DC jack (Radio Shack wall transformer, battery pack, or whatever), and you unplug that source from the jack, the computer will automatically switch over to the internal set of four batteries without missing a beat. However, if you unplug the external source from, say, the wall or remove an alligator clip from the battery terminal, the computer will die an instant death. Plugging the power source in again will not restore operation even though the power switch on the computer is still on. You have to turn the computer power-switch off, then on again, to restore operation.

It's an interesting phenomenon—the computer will resume exactly where it left off. If a program was executing, you'll be back in the thick of it. If you had been working on some word-processing item, that's where you'll be again.

Another point about these construction projects: You can use any sort of connecting devices available; I made use of items I had lying around the house. ♣



The Elpower Gel Cell

This handy power source is shown with the coax connector hooked up using alligator clips.

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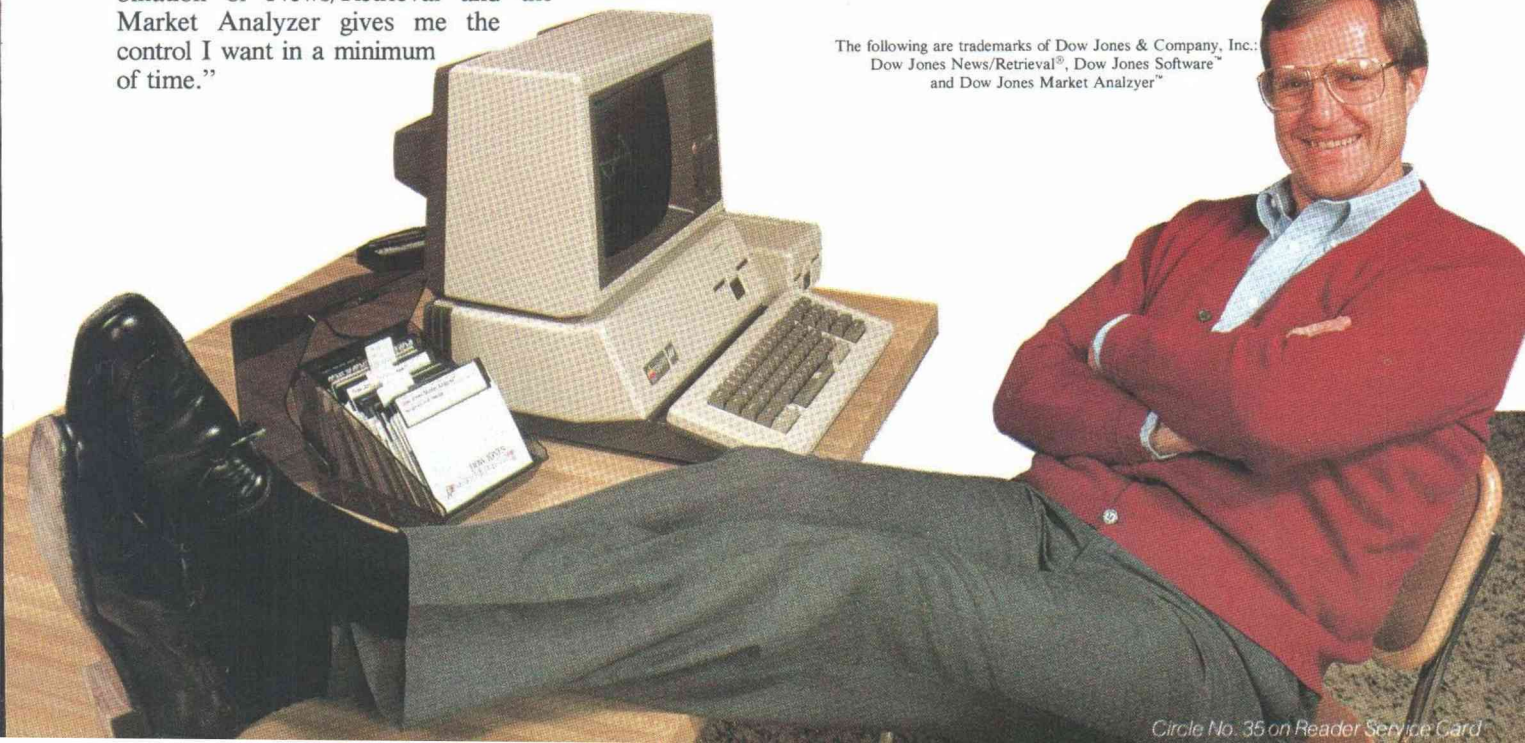
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WILL THE 100 AND LODGING INDUSTRY MIX?

Most hotels and motels exist in an electronic Stone Age, and the cost and uncertainty of high-tech upgrades may keep them there for some time to come.

By Paul Robbins

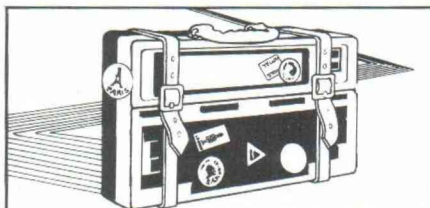
There is, as the saying goes, good news and bad news about using portable computers in your hotel room.

The good news, of course, is the technology exists to use your portable computer in the quasi-comfort of your hotel room, accessing just about anything electronic that you want.

The bad news is precious few hotels or motels, either chain-operated or individual properties, are making use of that technology. And it looks like it's going to be quite some time, if at all, before anyone decides to install modular telephones and pave the way for plugging into such technology.

BIG BUCKS. By and large, most companies seem to feel it's still too early in the game to invest big bucks into such electronic technology. They prefer to sit back and watch while someone else pioneers the concept.

"Your big chains always sit back and watch what everyone else is doing — and maybe that's how they became big. They didn't blow any big money trying to start something



TRAVEL

new," said Larry Shervenak of Shervenak-Keane and Co., a New York City consulting firm which recently completed a survey of the electronic technology in the hotel industry for the American Hotel and Motel Association.

Adds one industry observer who asked not to be identified, "It's hard to tell why some companies haven't gone to the modular phones but they apparently have other priorities. They're also probably pretty busy keeping up with new developments... and replacing mechanical [phone] switches with electronic ones can tie-up a lot of resources."

BOMBARDED. Bob Thigpen, senior telecommunications analyst for Sheraton Hotels, a 450-unit chain worldwide, said, "We've got the ca-

pability to install modular phones in all of the hotel rooms which we've built in the last two or three years but things are happening so fast and we're bombarded daily with proposals for new systems, so we're just watching developments right now. We've looked at the future waves and we're analyzing and evaluating them on what's amounting to a perpetual basis."

Thigpen sounds the rallying cry for most hotel and motel companies: "analyzing and evaluating." However, at this point, precious little seems to be taking place which will immediately benefit portable computer owners.

"We have a few locations [with some modular telephones] but, for the most part, we don't have them and it doesn't look like we'll be getting to them any time soon," according to Leslie Schlags, public relations supervisor for Marriott Hotels. Missy Williams of Holiday Inns said, "None of our company hotels [222 of the 1,735 inns] plan to install modular phones" and Ron LaRue of Westin Hotels echoed, "We haven't anything to report."

There are a handful of reasons why hotels are resisting the switch to modular telephones and, as they might say on Sesame Street, the reasons are brought to you by the letter P — as in price, pilferage, performance, purpose, and pressure.

PRICE. It's costly shifting phone lines, installing modular jacks, and

everything else that goes into converting a system to electronic. Bill Hussey, corporate communications [as in telecommunications, not public relations/communications] director for Quality Inns, estimated a \$60,000-75,000 pricetag for converting a 120-room inn; for a 400-room hotel, that jumps to about \$250,000, he said, and gets higher as the size of the hotel increase. And with the average telephone switch lasting an average of 15 years, according to one recent survey, no hotel manager is anxious to start ripping out switches with plenty of life remaining in them.

PILFERAGE. An undeniable (and costly) factor for so much of the hotel industry. Anything that isn't nailed down can sprout legs and "walk," i.e., disappear from a guest room, which is one reason you may have noticed many hotels dropping monogrammed ash trays or towels in an effort to discourage souvenir hunters. "One problem with modular phones is that people can disconnect them and steal them," said Marriott's Leslie Schlags.

PERFORMANCE. The rapidly changing state of the art with electronics is an understandable roadblock to simply jumping into what may appear to be a good idea. "Things are changing so fast," Schlags said, "and we're watching until things stabilize a bit." Hotels also are gunshy about portable computers and other elements of the electronics industry, these marvelous gee-whiz gadgets that smack of Buck Rogers and can fit in your briefcase, because — plain and simple — many hoteliers just aren't electronics-oriented. Hotels also have been singed with teleconferencing, another slick idea which hasn't worked profitably for any hotel — yet — and they don't want to barge ahead with another electronic idea.

It also should be noted hotels traditionally have been conservative about adapting to new ideas. Today, the older hotel executives and managers — the decision-makers in most outfits — know computers exist, but the reality is most of them are not comfortable in their own knowledge of electronics. Many of them are nuts and bolts people, far more at home selecting carpeting or wall-

paper, okaying designs for a high-rise addition, a new property somewhere, or a sales blitz to lure meeting business... but they keep computers at arm's length.

Or vice-versa. They use these newfangled machines to make and keep track of reservations, tally restaurant or bar tabs — and electronically post them from some corner of the hotel to your room bill, and for other purposes. But it's usually someone else on the staff who handles that chore. When you get right down to it, the upper echelon, the senior execs and managers, are itchy about all this electronic stuff. The next generation is more at ease and the third level, just starting out, clearly is more at home with electronic reality.

PURPOSE. While installing something for one reason is understandable, hoteliers recognize the multiple capability of electronics and want to see if they might not be better able to utilize any system. "Multiple purpose technology certainly has slowed down the hotel industry a bit," explained Shervenak. "They may start with a security or fire safety system or something for energy conservation, and then if they can add-on other capabilities, it makes the investment look that much wiser, that much better, so they're taking a long look at what can be accomplished." Shervenak also points out the start-up on services such as restaurants and movie theatres which might be included in systems, or perhaps airlines schedules and ticket prices, can be staggering, requiring immense investments of time. "You've got to contact all these different sources; it doesn't happen quickly," he said.

PRESSURE. Hotels are in the business of responding to what guests want and, according to our survey for hotel and motel chains, officials claim they haven't been hearing from enough guests who want modular phones or other electronic capabilities. It's starting, they concede, but any demand is barely a whisper. "The demand," said Ed Sprague, Travelodge director of property improvement, "is still for a good bed, nice TV, nice decor in a room; that's what most people still are primarily concerned with in a hotel or motel. The demand for electron-

ics will come but it hasn't surfaced yet." Hussey, however, concedes, "We're starting to hear from Quality Inns franchises who say their guests are beginning to ask for these things."

Hussey, who was in the computer industry before coming to Quality, said the rapidfire evolution of technology may enable hotels to leapfrog over modular telephones into some as-yet-unknown technology for computers.

Quality, for instance, is exploring the use of bidirectional phone switches with Ma Bell, i.e., switches which have the capability of handling computers without having to disconnect from the main phone.

STONE AGE. "It's hard to predict where technology is going to lead but hotel telecommunications today looks a little like the computer business of a few years ago...only it's working a lot faster," he continued. "Hotels, in some ways, are still in the Stone Age but they're rapidly moving into the Space Age. The portable computer is going to become tremendously popular, there's no question about that. One important thing, though, is that while change inevitably will come, that we don't change just for the sake of change."

Or, as Shervenak concluded in his latest lodging industry survey for AH & MA, "Multipurpose guest room terminals are going to intrigue the lodging market more than impact it in the next couple of years." ▲



WHAT THE MAJOR CHAINS SAY

Although technology exists to facilitate the use of your personal computer in your hotel or motel room, it doesn't look as though many properties will be converting to electronic technology in the future.

A spot-check of major hotel and motel companies turned up the following comments about installation of modular telephones:

WESTIN HOTELS. "It's not happening anywhere with us. We haven't anything to report," said Ron LaRue, director of advertising and public relations.

SHERATON HOTELS. "We've looked at the future waves and we're analyzing and evaluating them on what's amounting to a perpetual basis. Everybody is doing a lot of talking but we're proceeding cautiously," according to Bob Thigpen, senior telecommunications analyst.

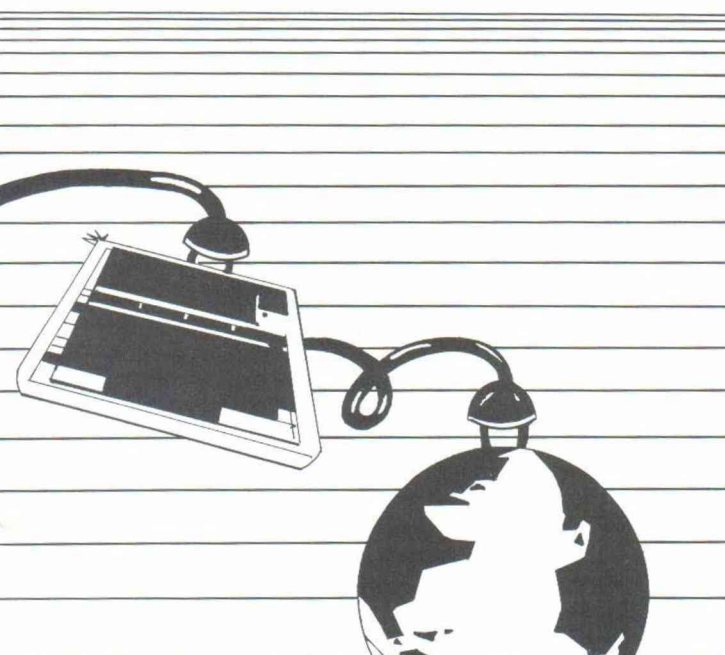
QUALITY INNS. Communications Director Bill Hussey said, "The hand-held or briefcase-held computers definitely are going to be the way to go but there are still a lot of things to study about them."

HOLIDAY INNS. "It hasn't taken hold," said Missy Williams of the corporate PR office.

MARRIOTT HOTELS. "For the most part, we don't have them and it doesn't look like we'll be getting to them anytime soon," reported Leslie Schlags, PR supervisor. "The state of the art is changing very quickly, but our people don't feel it's there yet, so we're not doing anything."

TRAVELODGE. Property Improvement Director Ed Preague said, "There's been no guest demand for anything like that."

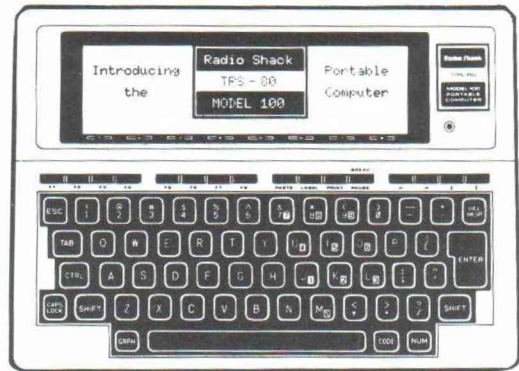
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More Than a Bath

Hotels have come a long way since the day when the height of luxury was a room and a bath. The newest guest amenity — the TravelHost network in-room computer terminal — is being installed in hotels in over 60 cities in the United States.

TOMORROW'S HOTELS TODAY

While the American lodging industry has, by and large, resisted installation of computer-oriented electronic equipment in guest rooms for a variety of reasons, a couple of major projects are underway.

Quality Inns, with about 475 hotels and inns in its system, will introduce its "hotel rooms of the future" at perhaps a dozen inns with the next year, a layout that includes in-room computers feeding off a local area network. Meanwhile, companies such as TravelHost, SuiteTalk, Coleco, and Direct Satellite Communications Ltd. are working on their own in-room computer systems.

VIDEO GAMES. Quality plans to use a System-1 IBM computer with an Atari system and screen for its local entertainment and information system. Guests will be able to play video games in addition to finding out information on area restaurants, theatres, movies, and other attractions.

Among the others, Dallas-based TravelHost is moving quickly to expand its system offering in-room computers accessing national and international information, electronic mail, and providing other capabilities. More than 130 properties in 85 cities and towns had

signed up for the system by mid-summer.

TravelHost offers "user friendly" computers made by Quazon Corp. of Dallas. Charges are made to one of three credit cards (AmEx, Visa, or MasterCard), not to your hotel room. Each property decides how many rooms go on the system; not all rooms in each property necessarily are included.

In addition to the videogames, the system provides information on local restaurants, airline schedules and fares, international stock market quotations, and other news, as well as job opportunities, electronic mail, and local shopping places.

CHI-TOWN. The Midland Hotel in downtown Chicago was the first hotel to install the TravelHost system, inaugurating it in mid-April. General Manager Myron Levy said there has not been an overwhelming demand for the computers (minimum use fee: \$3) "but it'll grow as people learn we have this system. We've gotten excellent publicity by being the first to go with it.

"Maybe it's not going to be enough by itself to make someone decide to stay here—and maybe it will be, but it's one more service which the Midland can offer that

most other Chicago hotels don't have," he said.

Gene Josephson, a Chicago stock broker whose office is across the street from the Midland, has become an unabashed cheerleader for the system. "It's great for my purposes," he said. "I've got a lot of clients in Europe and if I call them on regular Chicago time during the day, I may have missed them. Now, though, I can find out at the hotel [computer] about their closing stock quotations, then call and discuss things with them."

FLEXIBILITY. Josephson said he also uses the computer to plan trips, punching up the airline schedules and price structure. "I've got good flexibility because I can see right there all the different times, and, for instance, find out that if I fly out of O'Hare at 9 a.m. instead of 9:30 or 10, then I might save \$100. Sure, I could tell a travel agent to get me on such and such a flight, but this way I can see all my options right there."

He added, "I don't really see any drawbacks. There's more than any one person could use and everyone, of course, has different needs. It's a helluva strong operating aid for me and I've had my clients stay at the Midland, too, so they could use it. It's great." — Paul Robbins

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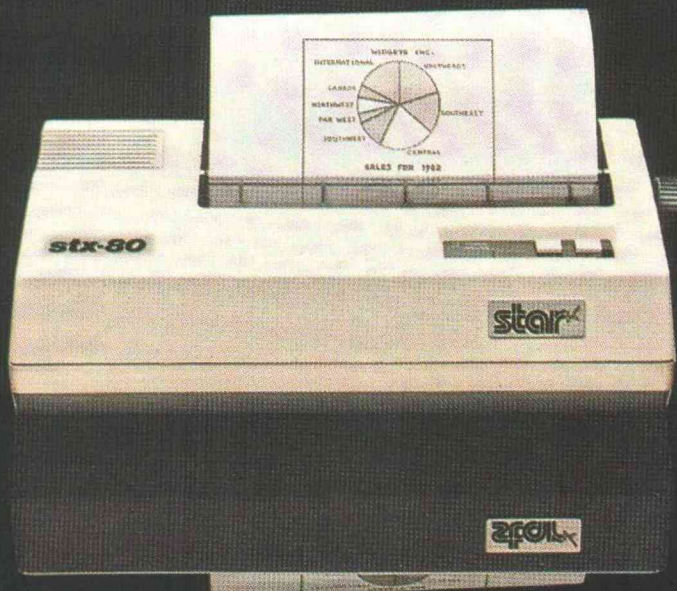
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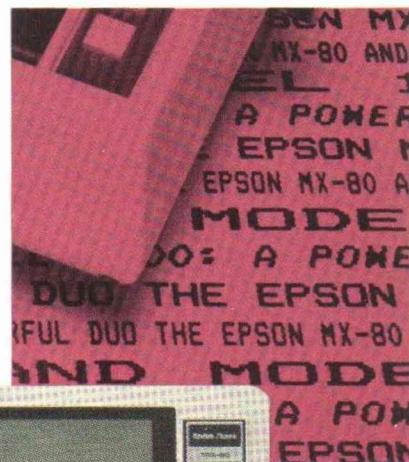
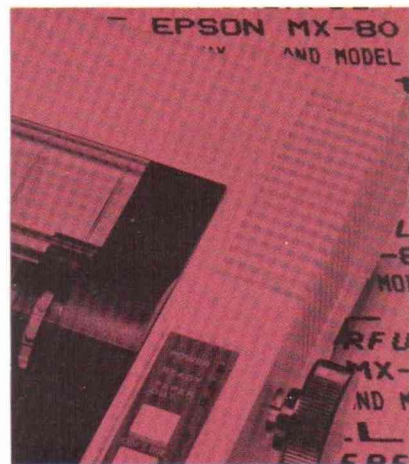
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MODEL 100:
200: A POWERFUL
TO THE EPSON MX-80
TO THE EPSON MX-80 AND MODEL 1
D MODEL 1



THE MODEL 100 AND THE MX-80: A POWERFUL DUO

Forget the fancy printer-drivers. Your 100's cast of keyboard characters make it easy to get the most from your Epson.

By THOMAS E. GRAVES

Exploiting the fancy capabilities of a dot-matrix printer is usually the realm of a high-powered, word-processing program or printer-driver, but with the Model 100 you can plant codes in the text of your documents to trigger features like italics, bold face, double-strike and double-width characters.

There is no explicit formatting capability with the Model 100 when using its print function. There is formatting capability with the 100 word-processor, though. These options are listed on page 60 of the user's manual. A control P must be placed before each printer code and the file *must* be printed by a SAVE TO :LPT:. The width command becomes disabled and the text needs to be manually formatted, including all the carriage returns.

However, for the Epson MX-80 III F/T with Grafrax Plus, printer codes may be placed directly in the text and sent to the printer using the print function. These codes may also be used with the various printers made by Epson but with other brand names on them and possibly with



printers which emulate the MX-80, such as the Mannesmann Tally Sprite and MT 160.

GRAPH AND CODE. The control codes are placed in the text using the graph and code keys. The graphics character is seen on the screen but the printer sees a command. The placing of commands is very similar to using HexPrintR with Wordstar because the codes are placed directly in text and then printed using the normal printing option. Unlike SAVE TO: LPT: and HexPrintR, the codes do not have to be prefaced by anything to tell the printer a control key is coming. The printer codes aren't printed and no space exists where the code was.

The full range of 255 ASCII

values can be accessed by the 100, including miscellaneous characters, graphics characters, and most of the print formatting commands. You can even generate individual italic characters with one key. Of course, the screen quickly becomes unreadable if this is done to any extent because the graphic character appears instead of the italic one.

What is happening is that the MX-80 recognizes both the code listed in its user's manual and that code plus 128(decimal). Thus, the compressed mode is turned on by sending the dot-matrix printer a 15 or a 143 (15 plus 128).

In binary, the only difference between a value less than 128, such as 15, and that value plus 128 (143) is the high order bit. Decimal 15 is binary 00001111 and binary 143 is 10001111. With nothing else being assigned to the command values plus 128, the MX-80 disregards the high order bit and sees the printer code. In fact, Epson lists several commands which could cause problems and says try sending the value plus 128. On the 100, 143 is the value of the graphics character made by hitting an E while holding down the graph key.

ASCII STANDARD. The values of the normal alphanumeric characters, however, are the values assigned to them by the ASCII standard. The standard fonts have

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values from 32 to 127. These character values are the same on all equipment using the ASCII standard. This is why the Epson and other printers require an escape before a command key with one of these values. The escape tells the printer what follows is a command, not a character. The values from 0 to 31 are also set by the ASCII standard, but these are the various control codes and various other things like null and escape.

The values from 128 to 255 are used differently by the various computers and printers that make use of them. Not all computers use the values above 128. The 100 uses these values to create screen graphics while the MX-80 uses these values to create the italic font and characters.

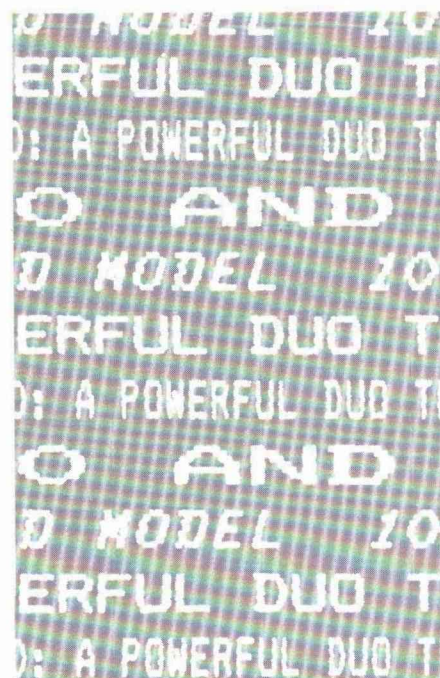
This alternate set bears the same relation to the standard set as the printer codes. Italic A has the value of standard A plus 128.

The same rule regarding the use of the escape key to obtain printer codes applies for these higher values. Those commands needing escape do not necessarily need 128 added to them. The value plus 128 is shown in the chart, but using either value will work. Thus, either an escape 4 or an escape plus graph 6 will turn on the italic print.

PROBLEMS. A few problems crop up. Some codes add a backspace. The only code I know that does this regularly is the one to turn subscripts on. By adding an extra space after this code, you will not find any missing letters. Some of the codes for individual characters, such as code D (Italic W), add a backspace if they are accidentally prefaced with a graph K (escape). The codes for the individual characters never need to be accompanied by an escape. The only code accompanying these character codes is the one to suppress compression.

Another problem is I have not been able to get constant form feeds using graph /. Sometimes a full form is ejected and sometimes not.

Finally, I have not been able to get all of the control codes to function. I have not been able to enable any of the commands requiring three keys, such as superscripts and turning off underlining. If you require commands not listed below, please ex-



periment. The needed command might be one I did not convert or you could find the key to enable commands I could not get to work. If you cannot get a needed command to work, you can always imbed control codes with control P and **SAVE TO:LPT:**.

When using the tables accompanying this article, capital letters are made by pressing shift and the letter. Placing the caps lock on results in lower case characters. A "Cc" would be formed by hitting the C key while holding the code key down. A "C C" would be made by hitting the code key while holding the shift and code keys down.

CHART EXPLAINED. The first character listed below in the chart is the one printed on the Epson. The second is the key selection on the 100 and is listed as two characters. The first represents either the graph or code keys while the second is the keyboard letter (upper or lower case) or other character used with the special key. The third is the ASCII decimal value of the computer or printer character.

The printer codes from 28 to 127 and from 156 to 255 require the use of two keys, escape and the specific printer code. This is done by first using graph K and then the printer code as the very next character.

Those items with an asterisk after them have some problems, like unwanted backspaces. These problems have been discussed above.

NOT ALL LISTED. Not all the Epson's control codes are listed below, only those I use the most. To obtain the value of other codes, look up the decimal value in the appendix of the Epson manual, add 128 (if the code is less than 28) to it, then look at the charts on pages 211 to 216 of the 100 manual to see which key combination equals that value. That is the proper character for the desired command.

One note of caution: When you print a screen to the MX-80, everything past any carriage return will print in the compressed mode. This happens because the printer sees everything on the screen, including the triangle used to denote the presence of a carriage return. This triangle has an ASCII value of 143—the value for turning on the compressed mode for the Epson. These carriage return symbols are invisible when printing a complete file and do not affect the print mode.

You don't have to do all your formatting using imbedded codes. There are formatting programs available to set your line spacing, margins, page numbers, and headers. One such program is PRINT.100, available to members of the Model 100 SIG on CompuServe. A version of this program also appeared in the July, 1983, issue of *Basic Computing*.

With one of these programs, you would only have to pay attention to the print modes: normal, double width, italic, double strike, emphasized, etc.

PRINT.100. With PRINT.100, you can have a header consisting of a title, the date, and the page number. By imbedding codes around the title, you can have an emphasized title with normal date and page numbers. You can also change modes in the text itself.

Until someone figures out how to turn off underlining, and I am sure someone will, you should use italics for such things as book titles and foreign words.

Remember, PRINT.100 works by counting characters. Expanded mode will overrun the page (actually it will wrap) and compressed mode will leave a gap at the end of the line. When formatting from scratch, these differences can be allowed for, but it is harder to do without of this kind of program.

Imbedding printer codes into Model 100 text is easy. It is simply entering the key selection having the values wanted. The only caution is in the need to add an extra space with the one or two commands that backspace. Feel free to experiment and have fun formatting.

NEC PC-8023A-C PRINTER CODES

After going over the manual and experimenting for a brief while, I have found you can also imbed some codes for the NEC PC-8023A-C printer. I was not able to imbed any printer control code.

Escape by itself is not entered into the text and escape plus 128 (155) is a graphics character. All 255 slots are filled with various fonts and graphics characters with the 8023. Thus, what you can obtain are the graphic and special characters with values above 128.

One value will not produce the same character on both the 100 and the 8023. The 8023, like the Epson, sees the carriage return and end of file arrow as graphics characters when you print the screen. If all you want are some of the special effects, then you can get them by imbedding the proper codes. If you want to change print modes, then you will have to use control P and SAVETO:LPT:

Of course, someone spending more time experimenting with this printer might prove me wrong.



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C=CODEKEY G=GRAPHKEY

BEEP(EPSON'S)	G	t	135
TAB	G	r	137
FORM FEED	G	/	*138
LINE FEED	G	s	139
DOUBLE WIDTH MODE	G	i	142
COMPRESSED PRINT ON	G	e	143
COMPRESSED PRINT OFF	G	;	146
DOUBLE WIDTH OFF	G	w	146
ESCAPE	G	k	155
"SPACE"	C	'	160
UNDERLINE ON	C	;	*173
ITALICS ON	G	6	180
ITALICS OFF	C	[	181
EMPHASIZED PRINT ON	C	-	197
EMPHASIZED PRINT OFF	C	e	198
2X STRIKE ON	C	i	199
2X STRIKE/SCRIPT OFF	C	q	200
SUBSCRIPT ON	C	(	*211
BACKSPACE	G	C	255

ITALIC FONT

A	C	3	194	a	G	!	225
B	C	8	194	b	G	@	226
C	C	9	195	c	G	#	227
D	C	7	196	d	G	\$	228
E	C	-	197	e	G	%	229
F	C	e	198	f	G	^	230
G	C	i	199	g	G	Q	231
H	C	q	200	h	G	W	232
I	C	k	201	i	G	E	233
J	C	l	202	j	G	R	234
K	C	j	203	k	G	A	235
L	C	y	204	l	G	S	236
M	C	N	205	m	G	D	237
N	C	z	206	n	G	F	238
O	C		207	o	G	X	239
P	C	!	208	p	G	U	240
Q	C	#	209	q	G	P	241
R	C	*	210	r	G	O	242
S	C	(	211	s	G	!	243
T	C	&	212	t	G	J	244
U	C	l	213	u	G	:	245
V	C	E	214	v	G	M	246
W	C	D	215	w	G	>	247
X	C	Q	216	x	G	<	248
Y	C	K	217	y	G	L	249
Z	C	L	218	z	G	K	250
1	C	A	177	2	C	O	178
3	C	U	179	4	G	6	180
5	C	[	181	6	C	a	182
7	C	o	183	8	C	u	184
9	C	S	185	0	G	7	176
!	C	x	161	"	C	c	162

#	G	8	163	\$	C	*	164
%	C	M	165	&	C	)	166
'	C	-	167	{	C	+	168
)	C	s	169	*	C	R	170
+	C	C	171	,	C	p	172
-	C	;	173		C	/	174
/	C	0	175				
;	C	d	187	<	C	,	188
=	C	v	189	>	C	=	190
?	C	F	191	@	C	1	192
[	C	J	219				
BACKWARD SLASH				^	C	Y	220
]	C	<	221		C	V	222
-	C	X	223				
RIGHT BRACE				G	H		251
VERTICAL DASHES				G	T		252
LEFT BRACE				G	G		253
SPANISH "TILDE"				G	Y		254

MISC CHARACTERS

BACKWARDS DIAGONAL	G	-	92
REVERSED '	G	[	96
LEFT BRACE	G	9	123
VERTICAL DASHES	G	|	124
RIGHT BRACE	G	0	125
SPANISH "TILDE"	G	]	126
BRITISH POUND SIGN	G	m	129
UMLAUT	G	f	130
ACCENT MARK	G	x	131
BACKWARDS ACCENT	G	c	132
LEGAL PARAGRAPH MARK	G	a	133
GRAPHIC/BORDER	G	h	134
GRAPHIC/BORDER	G	b	149
GRAPHIC/BORDER	G	n	150
GRAPHIC/BORDER	G		151
GRAPHIC/BORDER	G	,	153
GRAPHIC/BORDER	G	o	152
GRAPHIC/BORDER	G	1	154
GRAPHIC/BORDER	G	2	156
GRAPHIC/BORDER	G	3	157
GRAPHIC/BORDER	G	4	158
GRAPHIC/BORDER	G	5	159
"SPACE"	C	`	160

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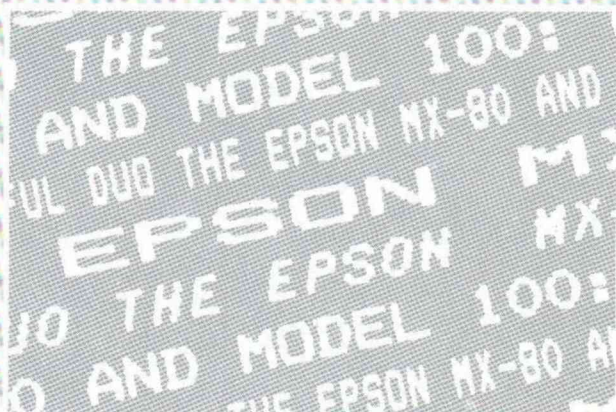
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MODEL 100 CONTROL KEY FUNCTIONS

The following is a chart of control codes for movement around in TEXT.

Some, namely the basic cursor controls, are similar to those used in Wordstar, dBasell, and Personal Pearl. Not all the Wordstar cursor functions are enabled, and some are enabled using a different set of keys.

For example, with Wordstar, control C will page forward in the text. With the 100, you must hit control B. The first time you enter control B, the cursor will go to the bottom of the screen. With each time it is entered after that, the text will page forward.

CURSOR KEYPAD

Control E
Control A S D F
Control X

CURSOR CONTROL

Control D Right one space
Control S Left one space
Control F Right one word
Control A Left one word
Control R Right end of line
Control Q Left end of line
Control I Tab (8 characters)
Control E up one row
Control X down one row
Control T top of screen and scroll up screen
Control B bottom of screen and scroll down screen
Control W beginning of file
Control Z end of file

FUNCTIONS

Control N Find
Control V Load
Control G Save
Control O Copy
Control U Cut
Control L Sel(ect)
Control [Menu (This works if hit twice in a row, i.e. Control [Control])
Control Y Print file (prompts for width)
Control C Break
Control H Backspace-Delete
Control M Carriage Return (Enter)
Control P For embedding printer control codes

DUPLICATE FUNCTIONS

Control] Left one character
Control ^ Up one line

The only control code that works from the menu is control M (Enter).

The following codes work in the Basic command level. Not all of the control codes available with MBasic are enabled with this dialect of Microsoft Basic.

Control C Break
Control H Backspace-Delete
Control M Carriage Return (Enter)
Control U Erase line
Control X Erase Line
Control] Backspace

When using TELCOM, a few control codes are available at all times. Other control codes are available depending on who you are connected with. For further information, check the manuals and help files of the various networks and boards.

Control S XOFF (To interrupt flow to screen temporarily)
Control Q XON (To restart flow to screen)
Control C Break
Control H Backspace-Delete
Control M Carriage Return
Control J Line Feed (This is essential if you are connected to another computer. The 100 does not issue a line feed when you press enter and if you do not also press control J, the 100 will overwrite the previous line. Control J is not needed when connected to CompuServe, the Source, and some bulletin boards. CompuServe, The Source, and Knowledge Index all recognize control S, Q, C, H, and M.

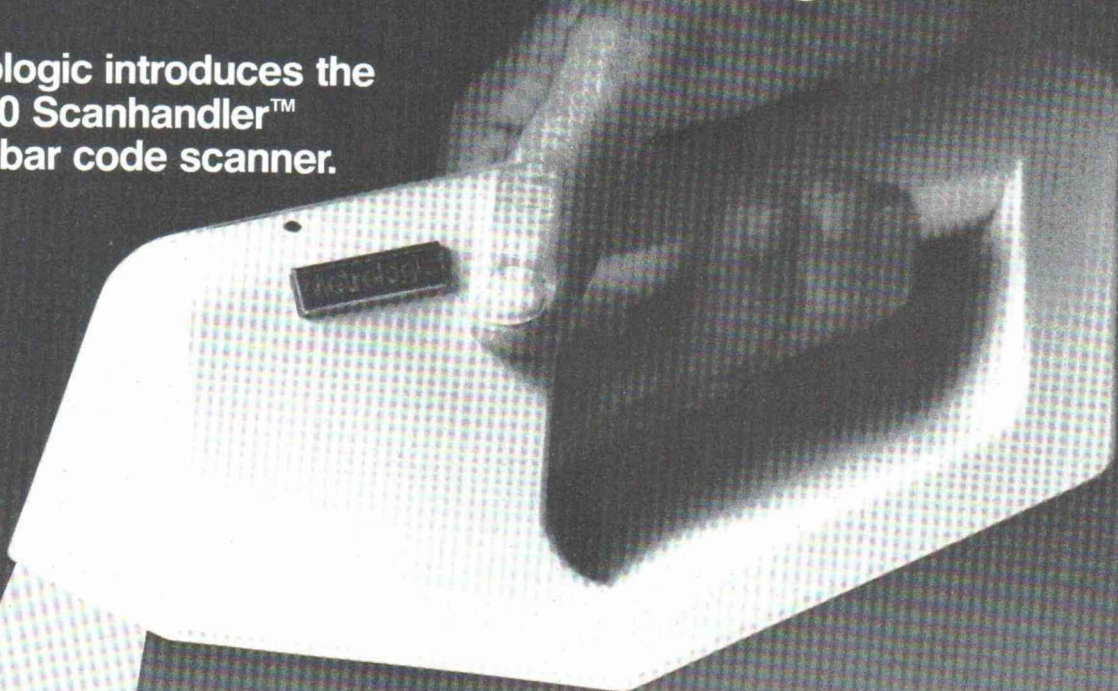
Control P will return user to command level for both CompuServe and The Source.
Control O with CompuServe's bulletin board and SIGs, will skip to the next message.

With Tymnet, the following codes alter the protocol settings of the host computer when added before typing in the host identifier (STC11, KI, etc). These codes change Tymnet's defaults and are not needed under most circumstances.

Control H Initiates Half-Duplex
Control P Sets Even Parity
Control R Enables XON/XOFF from host to you from within Tymnet
Control X Enables XON/XOFF from you to the host from within Tymnet. These last two settings are for a host not normally compatible with XON/XOFF, like Knowledge Index until recently.

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And because the Scanhandler is a non-contact reader, you get greater versatility, whether you're reading moving or stationary bar code labels.

The MS190 isn't just another hand-held laser either. It's truly unique in design and function. Because of the use of VLSI technology in our design, all three functions — scanning, decoding and communications — are built into the compact 15 ounce Scanhandler. It's also built for durability, with our unique steel-ceramic HeNe laser tube.

Electronics in the Scanhandler provide both 5 volt wand emulator signals and RS232 communications for direct input to your information processing system.

The Scanhandler is the newest advance in laser scanning but Metrologic isn't new to laser technology. We've built a reputation for quality and innovation in our laser products over the past fifteen years with applications as diverse as supermarket checkouts to military ordnance.

For a complete list of features and specifications on the MS190 Scanhandler, or to arrange a test demonstration of this unique bar code scanner, contact Metrologic Instruments, Inc., 143 Harding Avenue, Bellmawr, NJ 08031. 609/933-0100.



Metrologic

See us at Scan-Tech Booth #110

CASH REGISTER WITHOUT A CASH DRAW

A Radio Shack dealer in New Hampshire finds the 100 a dandy point of purchase terminal. He thinks you will, too.

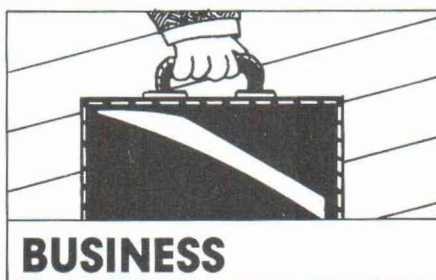
By PETER HAAS

I sell the entire line of TRS-80 computers at a Radio Shack franchise store, but my favorite is the Model 100. Customers always ask about disk drives and external monitors when I show them the 100. In both cases I have to answer, "Not yet." I almost want to add, "Who cares?"

Disks are a pain in the neck anyway; there's all that formatting and backing up to do. You also have to store them some place, find them again, and boot them up every time you want to use your computer. With the Model 100, all you do is turn it on, move the cursor to the desired application, hit enter, and you're running.

POINT OF SALE. For example, I use the Model 100 daily as a point-of-sale transaction register — a cash register without a cash drawer. The computer sits on my desk, taking up very little room, but always ready to run, no matter what other programs I might have been showing beforehand. The program that handles my sales will also allow me to give quotes on computer systems to prospective customers as well as keep track of special orders. In all three uses, a single file of stock numbers and prices is accessed by the program. This file contains all of the 150 or so items I regularly sell and runs faster than similar programs I have used on disk machines.

At the start of a run, the user is prompted for the nature of the ac-



tivity: a quote on equipment, a special order, or a sale. Then the stock number of the first item is requested, as well as the number of units desired. The computer then searches the file for pricing information and returns to the program with the information that corresponds to the stock number requested. For a quote, the 100 then displays the description of the item, the price of one, and the amount for the number being quoted. The process is repeated for additional equipment and, finally a total for all items is displayed.

SPECIAL ORDERS. If the computer is doing a special order, the information about the desired items is appended to a file just for orders, only in this case, the costs, rather than the prices are used, for bookkeeping reasons. Later, while on the phone, I can access this file directly and order the items from the file.

Finally, if the activity were a sale, the computer would behave in the same manner as if a quote were

being given, except information about the form and amount of payment would be requested. The change returned to the customer, if any, is then displayed. In addition, the information about the sale is appended to a file for sales, so this information can be recorded and checked against the cash on hand at the end of the day.

With little or no modification, this program should work in any small retail situation. But with a few changes a user could take advantage of the Model 100's portability and use the computer on the road to give quotes and take orders for any kind of sale situation.

ODD STRUCTURE. The peculiar architecture of this program is the result of its continuing evolution. It started out as a simple way to give quotes on computer systems for customers, but I then decided to add the special order and sales functions. If it were being written anew with these functions in mind, it would probably look a little cleaner. Nonetheless, it is not hard to understand on a quick walk-through.

Lines 10 through 140 are concerned with getting the function, item stock number, and quantity input to the program. At line 150 the subroutine at lines 1000 through 1200 is called. This searches the file PRICES.DO (see sample in box) for a match with the requested stock number. In the case of the sale of an unusual item without a stock number, this subroutine is skipped and the program jumps to lines 600-630 for the user to add the pricing information. Normally, however, when the computer finds the match in the price file it returns to the main program with the corresponding description, price, and cost of the item.

Next, depending on what function was originally requested, the computer branches to the appropriate program area. In the case of a quote, that would be line 190 through 320, where the description and prices are displayed. If more than one item is included in the quote, the extra items are included by looping back to line 100 for more stock numbers. A running total of the items in the quote is kept by the variable G and is displayed at the end of the run at line 310.

ORDERS.DO. For special orders, the computer branches to lines 2000 through 2110, where the information obtained from the prices file is added to the file ORDERS.DO (see sample in box). The variable X is the extended cost for the order, obtained by multiplying the number ordered, D, by the cost of one, R. The date of the order is printed to the file as a check on lost items or back orders from the supplier.

In the case of a sale, we jump to line 2300 and the file SALES.DO (see sample in box) is opened for appending. This works much the same as the special orders subprogram except line 2320 is needed for the items without stock numbers. Furthermore, lines 2400 to 2480 are used to handle the form of payment and change calculation. The total sale and form of payment are also

appended to the sales file for record keeping purposes at the end of the day.

The file of pricing information, PRICES.DO, is created in the text mode. The stock number, the price, a four letter description and the cost are typed in on one line. Each line in this file should have the same format of string length and commas. The only tricky part here will come if your stock numbers and descriptions are different than mine. If they are, you should review the sections of the Model 100 owner's manual that deal with the Basic keywords LEFT\$, MID\$, and RIGHT\$, and then change lines 160, 200, 1020, and 2310 appropriately. You should probably try running the program after you enter your first few items in the file to be sure you are setting things up correctly.

TRUE INVENTORY. Future additions to this program will probably include the ability to actually keep track of the number of items in stock (a true inventory program), and perhaps a subprogram to upload special orders through the modem. I hope that the program I have listed here will give you some idea of the power of the Model 100 to run real applications programs in a business environment. Needless to say, if the inventory in the computer were very much larger than mine, space and access time could become problems. However, even though I am using only a 24K machine, I still have plenty of room for all my other demo programs as well as space for this article, which I am writing at home.

Listing begins page 50

PRICES.DO sample.

2200303	03.79	BOOK	0002.39
2200304	05.95	BOOK	0003.43
2201075	29.95	CABL	0021.86
2202345	00399	PNTR	0327.52
(...to EOF)			

ORDERS.DO sample.

07/05/83:	2200304	BOOK	10	\$ 34.30
07/05/83:	2202345	PNTR	1	\$ 327.52
07/06/83:	2201075	CABL	5	\$ 109.30

SALES.DO sample.

```

07/05/83: 2200303 BOOK 1 $ 3.79
TOTAL $ 3.79 CASH
07/05/83: 2201075 CABL 1 $ 29.95
07/05/83 2202345 PNTR 1 $ 399.
TOTAL $ 428.95 VISA

```



```

10 CLEAR 2000
   :MAXFILES=3
   :G=0
   :T=0
20 CLS
   :BEEP
   :PRINT " "
30 PRINT "QUOTE, ORDER OR SALE? (Q/O/S)"
40 A$=INKEY$
50 IF A$="Q" THEN 90
60 IF A$="O" THEN 90
70 IF A$="S" THEN 90
80 GOTO 40
90 CLS
100 BEEP
   :BEEP
   :PRINT " "
110 PRINT "STOCK NUMBER? (X IF NONE)"
120 INPUT C$
   :BEEP
130 PRINT "HOW MANY?"
140 INPUT D
   :IF C$="X" THEN 600
150 GOSUB 1000
160 DESS=MID$(Z$,15,4)
170 IF A$="O" THEN GOTO 2000
180 IF A$="S" THEN GOTO 2300
190 CLS
   :PRINT DESS
200 P=VAL(MID$(Z$,9,5))
210 E=P*D
   :G=G+E
220 PRINT "PRICE EACH IS: $";P
230 PRINT "ALL OF THEM WOULD BE: $";E
240 PRINT " "
   :BEEP
250 PRINT "ANY MORE UNITS? (Y/N)"
260 F$=INKEY$
270 IF F$="Y" THEN GOTO 90
280 IF F$="N" THEN GOTO 300
290 GOTO 260
300 CLS
   :BEEP
   :PRINT " "
310 PRINT "TOTAL COST OF THE SYSTEM: $";G
320 GOTO 500
500 MAXFILES=1
   :END
600 PRINT "PRICE?"
610 INPUT R:Y$="XX"
620 PRINT "DESCRIPTION?"
630 DESS=INPUT$(4)
   :GOTO 2300
1000 OPEN "RAM:PRICES.DO" FOR INPUT AS 1
1010 LINE INPUT #1,Z$
1020 Y$=LEFT$(Z$,7)

```

```

1030 IF Y$=C$ THEN GOTO 1100
1040 IF EOF(1) THEN GOTO 1200
1050 GOTO 1010
1100 CLOSE
   :RETURN
1200 CLOSE
   :CLS
   :PRINT "ITEM NOT LISTED;TRY AGAIN"
   :GOTO 100
2000 OPEN "RAM:ORDERS.DO" FOR APPEND AS 2
2010 R=VAL(RIGHT$(Z$,7))
2020 X=D*R
2030 PRINT #2,DATE$;" " ;Y$;" " ;DESS;" " ;D;" " $";X
2040 BEEP:PRINT "ANY MORE? (Y/N)"
2050 K$=INKEY$
2060 IF K$="Y" THEN GOTO 2100
2070 IF K$="N" THEN GOTO 2110
2080 GOTO 2050
2100 CLOSE
   :GOTO 90
2110 CLOSE
   :GOTO 500
2300 OPEN "RAM:SALES.DO" FOR APPEND AS 3
2305 IF C$="X" THEN 2320
2310 R=VAL(MID$(Z$,9,5))
   :PRINT "PRICE: $";R
2320 X=D*R:T=T+X
   :PRINT "SUBTOTAL: $";X
2330 PRINT #3,DATE$;" " ;Y$;" " ;DESS;" " ;D;" " $";X
2340 BEEP
   :PRINT "ANY MORE? (Y/N)"
2350 K$=INKEY$
2355 IF K$="Y" THEN GOTO 2510
2360 IF K$="N" THEN GOTO 2400
2370 GOTO 2350
2400 PRINT "TOTAL: $";T
2410 PRINT "PAYMENT? (CASH,CHCK,VISA,CHRG)"
2420 INPUT PAY$
   :BEEP
2430 PRINT #3,"TOTAL $";T;" " "PAY$
2440 IF PAY$="CASH" THEN GOTO 2460
2450 GOTO 2500
2460 BEEP
   :PRINT "CASH TENDERED?"
2470 INPUT L
   :K=L-T
2480 BEEP
   :BEEP
   :PRINT "CHANGE: $";K
2485 PRINT "HIT ENTER TO END"
2490 INPUT E
   :BEEP
2500 CLOSE
   :GOTO 500
2510 CLOSE
   :GOTO 90

```

*See p. 4 for an explanation of *Portable 100's* program listing format.

THE PORTABLE TO TRANSPORTABLE CONNECTION

This author-photographer used a little ingenuity and perseverance to get his 100 talking to his Kaypro II.

By JIM HUGHES

Last year, after seven years of painstaking research, much of it accomplished by my wife while I produced a very demanding magazine, the time came for me to face up to writing the large and complex biographical book we'd been working on. Visualizing the task of creating, editing, rewriting, and typing at least three and perhaps six drafts of a 500-page manuscript, not to mention keeping track of detailed footnotes throughout, we decided to buy a microcomputer.

My requirements were straightforward. I wanted a portable machine that would travel easily between our Maine cabin and our New York brownstone, since I planned to write for extended periods in both places. I wanted a solid, well-designed machine that could take some hard knocks and survive in a furry environment (we have four cats and two dogs). I needed a relatively powerful word-processing program that allowed for large chapters, innumerable footnotes, extensive indexing and complicated formatting — the latter because I intended to design my own book dummy around my photographer-subject's work. And I wanted all this for as little money as possible.

KAYPRO. In the fall of '82, I chose a Kaypro II. It was getting good press, had a sharp 9-inch screen offering an 80-character display, and its keyboard was beautiful. Initially, it came with the Select word processor, a simple, even elegant program I



would have loved if I didn't have my book to write. I was told, however, help was coming in the form of Perfect Writer. The much-heralded package of disks did arrive about a month later, after much nagging on my part of a harassed dealer. Two months after that, I finally felt I was learning its intricacies, such as the proper use of split-screen file accessing. And after three, maybe four, months, I began to feel as comfortable at the Kaypro as I had at my Royal manual: Writing had become automatic again. In fact, I had taken to doing *all* my writing, magazine as well as book, at home.

In the spring of '83, however, my circumstances changed, allowing me substantially more time for the book, but still requiring my presence a few days a week in an office that was neither my cabin nor my brownstone. I was in a quandary. Should I go back to writing on a Royal in the office, or find a way to commute with the Kaypro — still 26 pounds and larger than Steve Allen's breadbox — on the subway?

DISCOVER 100. As luck would have it, at about that time I noticed a magazine piece about a new, notebook-sized computer — a *true* micro — weighing less than four pounds, had a regulation typewriter-style keyboard, and displayed work on an 8-line-by-40-character LCD screen.

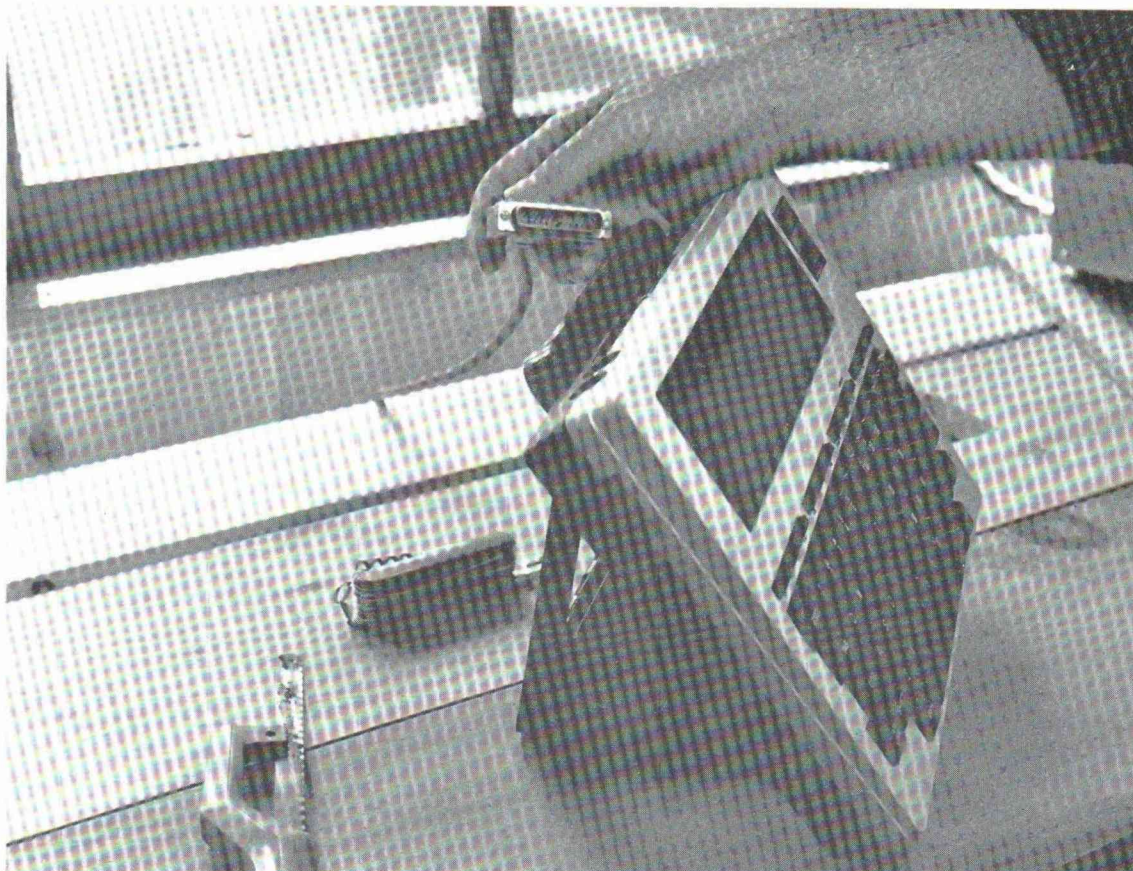
The TRS-80 Model 100 used batteries, and offered file storage in a memory that stayed non-volatile as long as a built-in nicad had life. Perhaps this was my answer. But at about \$1,000 for a 24K version, plus the \$2,250 I'd already spent on my Kaypro and an Epson printer, my investment would jump to more than \$3,500 when taxes were added in. On the other hand, it would be completely deductible.

I hemmed and hawed. One day my wife happened to talk with an old friend of ours, also a writer, who said she was using the new little TRS-80 100 in conjunction with her Eagle. I called that night, and discovered her brother, a computer whiz and an Eagle dealer, had had to write a special program for the Eagle to enable it to "listen" to the TRS-80. I called the brother. He said he had spent the *entire* three-day Memorial Day weekend figuring out the program.

"Would it work on a Kaypro?" I wanted to know. He said it wouldn't, and the Kaypro would probably be even more of a problem; but he'd call me back if he thought of something. He didn't call.

DUMB TERMINAL. I called Radio Shack in New York, where a woman kept insisting that since all you had to do with a TRS-80 host computer is tell it to save what its little brother has sent via an RS-232C umbilical cord, it "must work the same way with your Kaypro. Just tell it to save, that's all!" I didn't have the heart to tell her that Kaypro II's come equipped to be "dumb terminals" only. They can receive, but saving to disk is another matter.

Undaunted, I visited the local Radio Shack Computer Center. There, a fellow appropriately named Hal demonstrated the Model 100 beautifully, but couldn't answer my specific questions, either. He was honest enough to tell me that my



RS232 Scalpel

When RS232 wouldn't fit 100, Huges took a hacksaw to the cable.

projected hookup *might* not work, gave me a pinout diagram of the 100's RS-232 terminal, and suggested I get the same for the Kaypro from my owner's manual. (It's not there; a call to my dealer's service department produced the information, however.) The pins almost, but not quite, matched.

I called my beleaguered dealer and asked for a communications program for the Kaypro. He suggested something called AsCom, for \$175. I called Kaypro; a tech rep there suggested SuperCom, for \$175. I called Lifeboat in New York; back to AsCom, same price. I then remembered an advertisement I'd seen in the Kaypro Users' Group newsletter. Quest Software (9 N. Main St., Suite 100, Lombard, IL 60148) offered two communications programs: Smartcom, for \$24.95; and Kaymodem, \$69.95. I called, and a friendly voice told me that for my purposes, a direct connect with no auto-dial, auto-answer functions, the less expensive Smartcom would be best. I placed my order for next day delivery, and sighed a little.

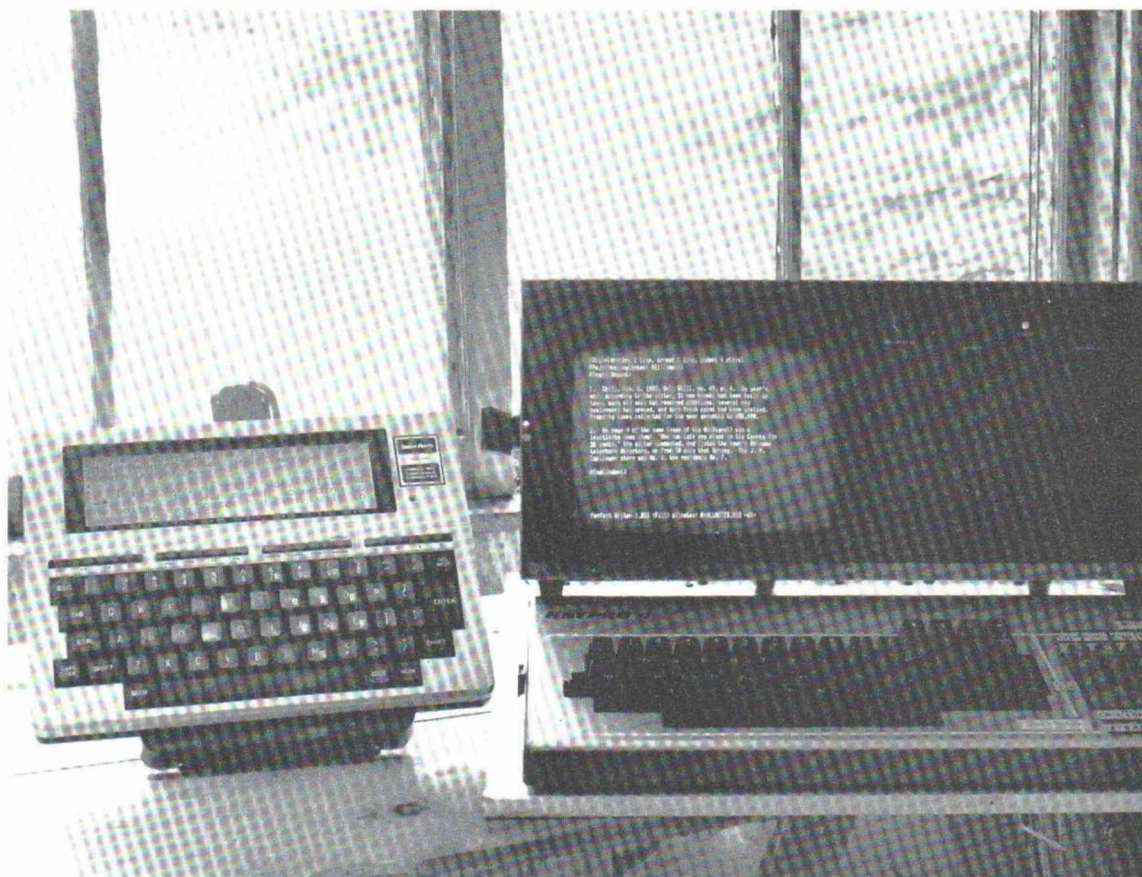
NO NULL. The next morning, I purchased a TRS-80 Model 100. Hal equipped me with a printer cable, modem connect, and a tape-recorder connect (in case I wrote too much during a session and needed a convenient storage medium); however, when he reached for an RS-232C cable and the so-called null modem adapter, apparently needed for two machines to "talk" directly rather than by telephone, he came up empty. Quick calls to several other New York area Radio Shacks produced the same result: Out of stock.

Finally, he sent me to Manhattan Electronic Supplies, 17 W. 45th St., N.Y. 10036, who could make me up a null-modem version of the RS232 cable for about \$30. They warned me, however, they guaranteed nothing. All they did was follow the customer's orders; so, out of my vast knowledge of computer electronics, I sketched the two pinout configurations, reversing pins 2 and 3 on the Model 100 end (thus, I'd been told, nulling the modem) and jumping pins 6 and 8 on the Kaypro end, since the 100's 8-pin had no func-

tion. The man behind the counter said this *might* work. I prayed.

The first problem came trying to plug the cable in. Standard blue-plastic plug casings fit Kaypros. They don't fit TRS-80 100s. I finally had to customize the plug with a hacksaw.

The second problem came after I wrote some test copy using the excellent text mode on the TRS-80, and tried to read it into the Kaypro. I followed directions to the letter, writing in stat parameters (in the case of the Kaypro, 38N1E), entering TELCOM's terminal mode, selecting up for upload, naming the file correctly, specifying a line-width, and pressing enter. I then cringed as my Kaypro screen displayed each line being accurately transmitted... and promptly overwritten by the next accurately transmitted line. Carriage returns seemed to make it; line feeds did not. Visions of three days worth of program writing filled my head—a terrifying thought, since I'd never written a program.



Kaypro II and 100

After some trying times, portable and transportable became sweet text mates.

NO LINE FEEDS. I decided to try printing and connected the Centronics-type cable between the TRS-80 and my Epson. Pressing the shift key and the print key, as instructed, produced the same result — this time manifested in a very dark line of ink on paper. I then remembered the tiny DIP switches inside the Epson. One of them (SW2-3) gives an automatic line feed with each carriage return. I reached inside with a straightened paper clip, through the hinged access door underneath the paper feed and turned the switch on. It is not convenient, but it is possible.

And it worked. Copy printed perfectly at whatever width I specified. I then decided to print italics and bold face, and found the appropriate instructions on page 60 in the Model 100 manual:

"CTRL-P will allow you to imbed printer codes (for bold face, underlining, etc.) in a text file. These files must then be printed using the general device command SAVE TO: LPT: (press F3 and type LPT:). Even though the codes will appear on the

screen, they will not be printed on the printer. (If you print the file using shift-print, the codes will be ignored and printed out on the printer.).... SAVE LPT: does not use the width feature; you will have to format your text and place carriage returns where needed.

IMBEDDING CODES. I did just that, pressing enter every line and a half to get a width of about 60 characters, my normal Kaypro format. Again, it isn't convenient, but it is possible. Then, to get italics, for example, I simply toggled the function on in the Epson with CTRL-P, ESC-4, and off with CTRL-P, ESC-5. Predictably, I screwed up at first, forgetting to type a colon after LPT. When I finally followed instructions properly (meaning, when I finally read the instructions carefully), the copy printed out precisely as I wanted it to print out.

Fine and dandy. But it was midnight, and I still hadn't gotten a text file from the Model 100 saved onto a Kaypro disk. I decided to sleep on it. And the next morning, I had an idea. If the SAVE TO: function al-

lowed imbedded commands to be given to the printer, perhaps it would do something similar with a host computer. It was worth a try.

SAVE COM. I searched the manual for appropriate instructions. There were none. All I could learn was how to save to a cassette tape recorder "or other device." No specifics. Surprisingly, the little stapled *Quick Reference Guide* proved more helpful. On page 23, for example, it gives the various printer commands possible through Basic, and includes SAVE LPT, which I saw as a variation on the SAVE TO: function key. Since the printer was abbreviated LPT, I wondered what an RS-232C device might be called. I found the answer on page 33: COM.

I wrote new copy via TEXT, without imbedded carriage returns, and then tried, directly from the text mode, SAVE TO: COM:. The Model 100 flashed "Aborted" at me.

I went back to the *Quick Reference Guide*. On page 35 was listed: SAVE COM: configuration writes the current Basic program out the commu-

nications line, in ASCII format. SAVE COM:38N2E.

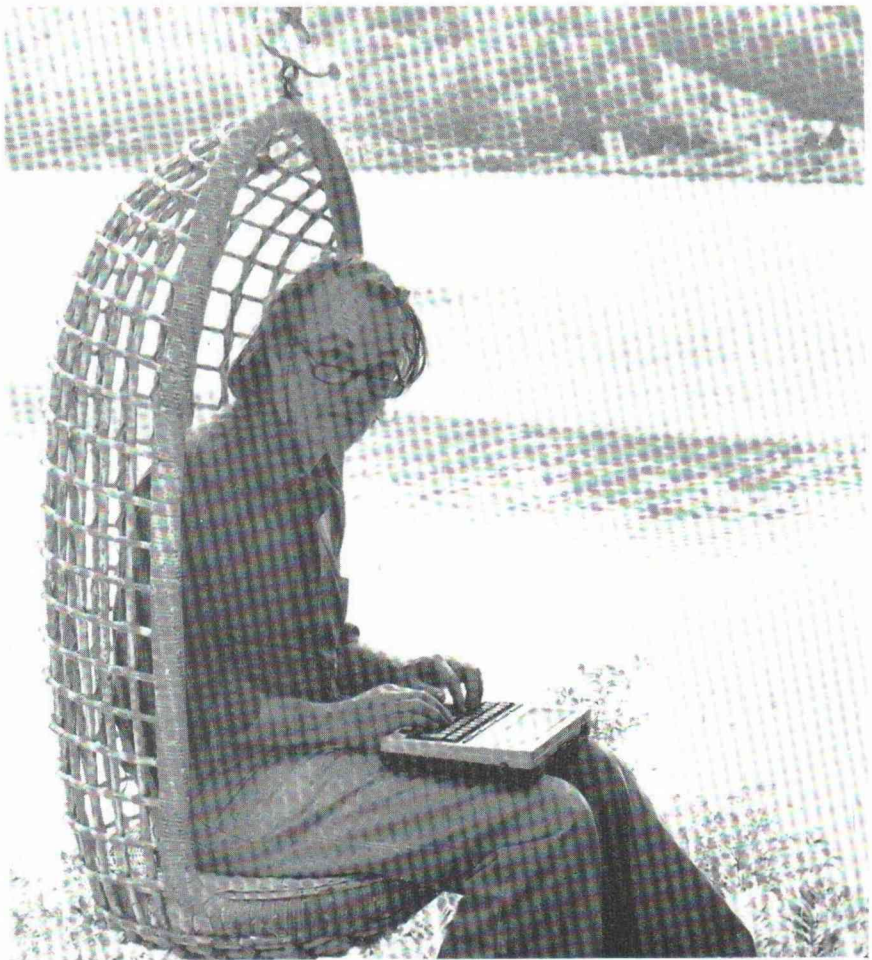
That was it! I tried again, pressing the F3 (save) key, answering SAVE TO: with COM: but this time following the colon with my own host computer's communications parameters: Baud rate, 3 for 300; Word length, 8 bits; Parity, N for none; Stop Bits, 1; and X-On, X-Off Status, E for enabled.

RELIEF. I watched, relieved, as line after line displayed on my Kaypro screen. The lines played out full width, without wordwrap. No matter. I followed Smartcom's instructions (Smartcom in Drive A) and saved the file, now named NEW-TEST.MSS to conform with Perfect Writer's filing system, to Drive B. I checked the directory, and there it was. Then I put my Perfect Writer program disk in Drive A, reset, called up the new file, and it was still there. But the lack of wordwrapping and the 80-character lines made it difficult to read and edit.

I decided to try a final ploy. Perfect Writer uses an ESC-Q command to rejustify paragraphs after editing. I put the cursor at the end of the first paragraph (a simple ESC-N command), keyed ESC-Q, and watched as the words instantly fell into a perfect paragraph. In a few seconds, I cleaned up the entire file in this manner. Then I called up the Perfect Format program, created a FIN file, and printed it normally (after returning the Epson DIP switch back to its off position). The page looked exactly like any other printed page I might have created with the Kaypro and Perfect; all my preconfigured formatting parameters applied, such as line width, lines pacing, paragraph indent, paragraph spread, ragged-right justification, page numbering, etc.

PERFECT COPY. I wrote more copy on the Model 100, this time using Perfect Writer's command language: first type an @ sign, followed by the command within specified "fences", such as brackets, parentheses, curly brackets, or quotes.

In addition to typeface commands, formatting possibilities are extensive. For example, the undent command allows the first line of each paragraph to hang out any number of characters to the left of



Jim Hughes

He likes the 100 because he can work with it anywhere.

the rest of the paragraph, which are flushed in automatically as if each received a manual tab. Center centers a line or a series of lines. Major heading centers and boldfaces a line, and sets it off a specified number of lines above and below. Include appends text into a file from any other file on a disk; in fact, a file called BATCH. MSS can make up a series of "includes", then printed as a single, completely contiguous large file.

With the Model 100-Kaypro-Perfect connection, footnoting, indexing, and creating a table of contents, are all possible — and automatic.

EXCELLENT TOOL. The TRS-80 Model 100 is an excellent tool for on-the-move writing; it offers a simple word-processing program that enables effective text manipulation — in some ways, better than the Kaypro's. The Model 100 has almost no formatting capabilities, however, leaving you at the mercy of your ability to come up with appropriate manual

print commands (my Epson is equipped with a device called Fingerprint, which does make life easier by offering pre-selectable typeface modes, indented left margins, and perforation skipovers). Combine the Model 100 virtues with a full-fledged word processor, especially one like Perfect Writer offering extensive editing capacity and real formatting power, and the writer's options open like a morning glory.

This article was written partly on my Model 100 — at a restaurant, on my deck overlooking a Maine pond and Ragged Mountain beyond, even on the john. Time suddenly becomes an ally; it doesn't need to be wasted. In fact, while I am sitting in my country study, doing a final edit on my Kaypro, my wife is out on the deck using the Model 100 to transcribe one of the 400-odd taped interviews we have had to make for the book. It will, later this evening, be saved to a Kaypro disk, where it will be instantly accessible when I need it. ▀

ROM KEYBOARD TRICKS FOR LIVING LIFE BEYOND INKEY\$

INKEY\$ is a fine programming tool, but it has some drawbacks. Get around them by using machine code to scan your keyboard.

By JAKE COMMANDER

The INKEY\$ function in Basic is a useful and often-used feature enabling characters from the keyboard to be input one at a time. This allows all sorts of special routines to be written which handle keyboard input in ways which can't be achieved using the INPUT statement. A typical use is in a line such as the following:

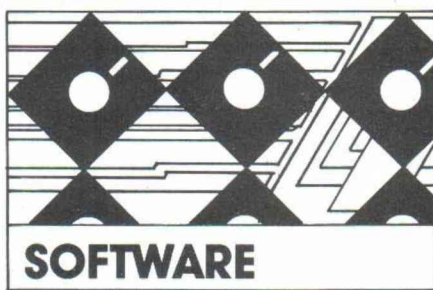
```
100 A$ = INKEY$  
    :IF A$ = "" THEN 100  
110 IF A$ = "1" THEN 200  
120 IF A$ = "2" THEN 300
```

This is useful to stop a program at a particular line until the operator hits a key, at which point the program takes appropriate action. It could also be done more elegantly by using the INSTR function like so:

```
100 ON INSTR("12",INKEY$) GOTO  
    200,300  
110 GOTO 100
```

INKEY\$ ALTERNATIVE. However, key capture via the INKEY\$ statement — despite being extremely useful — does have a couple of drawbacks. The major one is its speed. Somewhere along the line, Basic has to assign string space to the INKEY\$ function even if a named variable isn't involved. The assignment of this space coupled with the keyboard decoding routines serves to slow down such input.

Another more subtle situation arises when using INKEY\$ on the



Model 100. It can be regarded as an advantage or disadvantage depending on the application. This is caused by the type-ahead feature allowing keys typed in to be thrown at a program when it needs them, rather than at the time the key is hit. This is great in an environment where it's important not to miss a single key. You don't need it though in a program needing to scan the keys in real time. This can arise in certain types of software such as simulations or educational and game programs.

MORE POWER FOR YOU. But besides INKEY\$, there is another way of sensing which key is being pressed on the Model 100. It gives you a faster and potentially more powerful method of handling direct key input. By understanding this method, you gain insight into the hardware operation of the Model 100's keyboard. To use this method requires a scan of the keys directly from machine code, but don't panic: It can be performed with little difficulty from Basic.

First, take a look at figure 1. This shows the layout of the keys as they

appear to the 80C85 microprocessor in the heart of the machine. Notice things like the percent sign and ampersand don't appear in the matrix because they aren't separate keys at all, but combinations of keys. This points out an important aspect of reading keys at the hardware level: ASCII characters are not detected by hardware — only physical key-contact locations are. So you'd be able to detect the 7 key but the only way you'd know it was 7 and not & was because the shift key wasn't being pressed.

HARDWARE SCAN. Okay. So much for the groundwork. Now for the nitty-gritty. When the hardware scans the keyboard, it looks at the columns as shown in figure 1. (It looks up the page through all the rows at once.) The particular row being sensed is at the discretion of the programmer. It's really that simple: You just decide which row you want to look at and then read the columns. This gives you any key that's pressed (even if it's more than one). If you're an old hand at this kind of thing, you'll be having no trouble — if not, an example should help.

Suppose you want to see if a Y is being pressed. To do this, you need to send a signal (referred to as a strobe) down the bit-2 row. You then read the whole column and, if the Y is pressed, the strobe signal — having been diverted by the closed contact of the Y key — will appear in bit position 5 of the column. Incidentally, if the T key was also pressed, the strobe would be detected on both bit positions. Thus, you can even detect more than one key being pressed — something that INKEY\$ would never be able to do.

PORT INPUT. Up until this point, I've described what to do. Next you need to know how to do it. To read the key columns, you have to perform a port input. That's why I alluded to machine code earlier. Normally port input-output (I/O) is achieved from machine code. Fortunately, port I/O can be achieved using Microsoft's INP or OUT commands in Basic. Any port from 224 to 239 can be used to scan the keyboard columns (ports E0 to EF to the hex-minded). In Basic, a statement such as: 100 K = INP(224) would read the column into the variable A.

Before you'd read the columns, however, you'd need to decide which rows you wanted to scan. To do this you output the strobe signal to the keyboard via an OUT command. Two ports are used to accomplish this on the Model 100. Port 177 (or 185) sends a strobe to the primary keyboard matrix (that's the part of figure 1 which contains the 8-by-8 key matrix). Port 178 (or 186) can be used to send a strobe to the secondary set of keys.

ZEROES NOT ONES. The last piece of information needed to grasp the whole idea may be the opposite of what you expected. To send a strobe or receive a keypress, zeroes (not ones) are employed. By referring once again to the example with the 7 key you should see what I mean. Here's the whole sequence:

1) OUT(177),239

This sends a byte with bit 4 equal to zero and the rest set to ones. In binary it's 11101111 (or hexadecimal EF). So the keyboard row at bit position 4 gets strobed. This is the row containing the keys "87654321".

2) K = INP(224)

would then detect the strobe sent down the row at the position corresponding to the key pressed. If a 7 was being pressed, bit 6 would be zero. (Remember the strobe is a zero, so we'd see the zero passed via the 7 key.) So, if the 7 key alone was being pressed at the time of the strobe, the byte input would be 10111111 or 191 in decimal. It's a simple matter to find exactly which key is down by using the Basic AND function. In our example, 191 AND 64 would give a zero result — this zero is the strobe signal which indicates the keypress. The column being scanned for the 7 key is 64, binary 01000000 (bit 6 on).

To reiterate that sequence (which isn't so complicated when seen in pure Basic).

OUT(177),239:K7=INP(224)AND64


would set K7 to zero if the 7 were pressed or 64 if it were not.

As far as the primary keyboard matrix goes, that's all there is to it. The secondary keyboard row needs one extra step. This is because only bit 0 is used to do the strobing. Just because only one bit out of a possible

eight is used doesn't make things any easier. The other seven bits are actually used in the hardware of the Model 100 (one of them to power down the machine) and so they should be preserved. Thus you shouldn't just send a strobe bit to port 178 without checking bits 1 to 7 first. To do this, merely do an INP(178) and then OUT(178) that same byte without bit 0 set (in other words, AND 254). In Basic the line would look like this:

OUT178,INP(178)AND254

followed by an INP(224) to detect the strobe. This allows you to detect keys which are otherwise undetectable in Basic. You'll have a hard time scanning for the NUM key using an INKEY\$ statement.

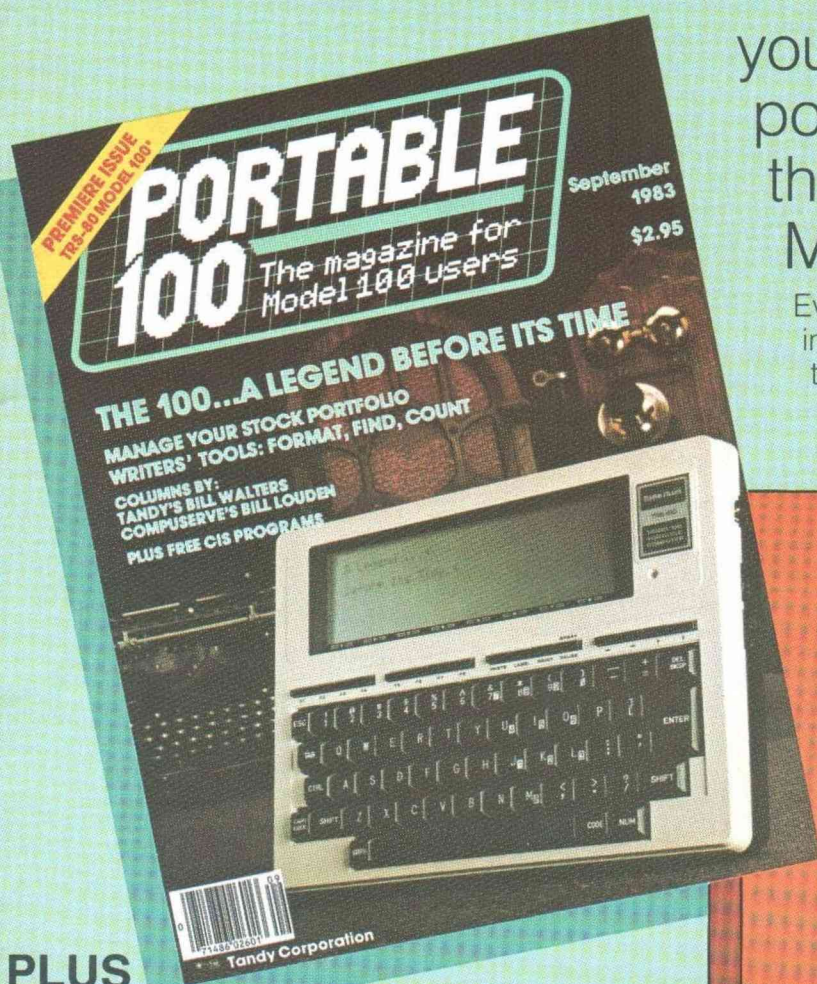
There you have it. The ins and outs of the Model 100 keyboard. The information presented here is most useful in machine code, where such luxuries as INPUT and INKEY\$ don't exist. But if the limitations of INKEY\$ are holding you back, you can now directly scan the keys without using any of the Model 100's I/O routines. 

ROM TABLE

	BIT	BIT	BIT	BIT	BIT	BIT	BIT	BIT
	7	6	5	4	3	2	1	0
7:	F8	F7	F6	F5	F4	F3	F2	F1
OUT6:	ENTR	PRNT	LABL	PSTE	ESC	TAB	BKSP	SPC
B1/B95:	DA	UA	RA	LA	=	—	0	9
ZERO 4:	8	7	6	5	4	3	2	1
STROBES 3:	/	.	,	\	:	[	P	O
2:	I	U	Y	T	R	E	W	Q
1:	K	J	H	G	F	D	S	A
0:	L	M	N	B	V	C	X	Z
OUT0:	PAUS	NC	CAPS	NUM	CODE	GRPH	CTRL	SHFT
B2/BA								

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statements, these restrictions will be a hindrance. On the other hand, the aforementioned memory restrictions of the Model 100 preclude monumental projects anyway.

WOEFUL CLOUDS. The documentation for PortaCalc contains the warning: "... [verification of the CLOAD process] ... is not very reliable." If you are a dyed-in-the-wool cassette fanatic, you can handle this as a minor inconvenience; if not, prepare yourself to struggle with the machinations of cassette management. (Hint: Don't worry about verification — if the program works for you, it is verified.) Now you can have some fun. Replication, homing, orders of calculation, rudimentary editing functions: All are at your command.

First you download PC.BA from cassette to memory; then, manipulate the files through your specific parameters. The former gives you the spreadsheet format; the latter, the ingredients. Columns are available in an A-N configuration; rows are A-Z. Columns are listed first in the cell address (for example, BH indicates column B, row H). Four columns and six rows are viewed at one time, with the scratch pad taking place on the top line of the screen prior to entry.

Values, formulas or labels may be entered into PortaCalc's cells. Negative, exponential and reciprocal values may be entered as well as integers. PortaCalc's arithmetic operators follow designations similar to its calc predecessors (+ for addition, - for subtraction, * for multiplication, / for division and up cap for exponentiation).

More than anything else, PortaCalc offers its fortunate owner the ideal spreadsheet program for the Model 100. What it may lack in sophistication, it compensates for in the ideal arena of simplicity and user-friendliness.

GOOD SENSE. I have heard recent talk Tandy is purchasing copies of the Expns+ program, the better to equip their field staff in presentations of the Model 100. It makes good sense.


To my knowledge, there is no other program on the market today for any personal computer that sets

for the 100: immediate access to individual expense records. Taxis, laundry, hotel rooms, dinners — all are entered as part of the continuing record of an expense journal. Twelve days may be accounted for on one record, with 18 rows for categories (plus column totals and cumulatives). It may not sound like much on the surface, but those of us in the throes of expense accounts (and their justification) will appreciate the manifest applications inherent to this program. In collaboration with the other segments of the Portable Computer Support Group's Model 100 programs, Expns+ offers a heretofore-unexplored segment of program applicability.

One of the greater benefits of Expns+ is its adaptability. With a mere change in row column titles, the overlay becomes a spreadsheet. In this mode, budgets, petty cash reports, departmental reports, financial statements, and cash flow analyses can be performed. When used in conjunction with the

Graph+ program and a Radio Shack DMP 100 dot matrix printer, pie-, bar- and line-charts can be produced for any Expns+ program.

The versatility of Expns+ by itself is astounding; when used with Graph+, it is incredible. It is such a big plus for the future of the Model 100 that software companies such as the Portable Computer Support Group and Skyline Marketing have developed exclusive programs to manifest their belief in the 100. Within the confines of the narrow ready-access memory (RAM), it is important to note both programs require in excess of 7.5K to get up and running; in a 24K machine, this precludes saving a lot of files in RAM.

My romance with the 100 will only increase as more software and memory is developed. One thing is certain: software companies are going to be hard-pressed to meet the standards of excellence pioneered by PortaCalc and Expns+/Graph+. My major concern at this point is: Does anyone want to buy a nearly-new Osborne or a sadly-neglected PC? 

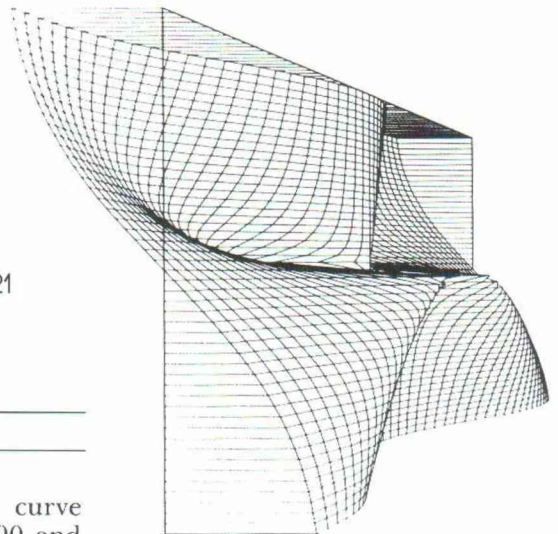
MATH AND BASIC SKILLS NEEDED FOR AUTO PLOT

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By CHARLEY FREIBERG

Autoplot is an automatic curve plotter for the Model 100 and the CGP-115 color graphics printer made by Radio Shack.

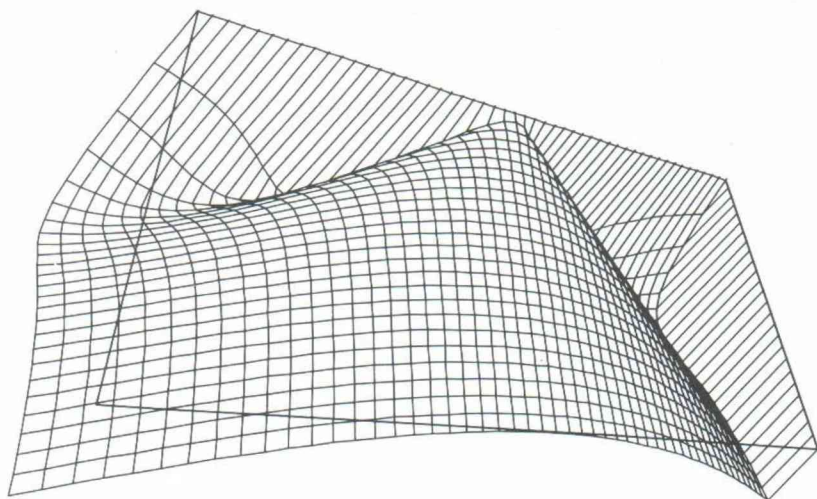
The program features the ability to plot color graphs of professional quality — with a bit of work and additional Basic programming; the ability to produce a choice of line graphs, scatter plots, bar graphs, doodling, drawing, and other pictorial representations; the ability to plot math functions or tabulated data; and the ability to plot several curves in the same diagram.



FEATURE PACKED. It also automatically scales and labels axes; uses linear or logarithmic presentations; allows grid overlays; and features numeric integration or differentiation, a powerful feature.

All this is provided for \$39.50.

Autoplot and the printer-plotter are good for those who need a simple visual graph to be used in a document. For a very serious and large presentation, a bigger printer-plotter would be advised.



The program is useful for business people, math students, and those who need any graphic representation, including fancy lettering. If you just like to make pretty pictures, the program could also come in handy.

DRAWBACK. However, the only drawback to the program as it stands — and the version we received was the preliminary one — is that you must know Basic. You don't need to know a tremendous amount or have 10 years of programming experience behind you, but you do have to be more than just a beginner. The routines aren't hard to figure out, but if you don't have a math background the whole thing could be a disaster. You would probably get nowhere and be totally frustrated.

The instructions don't provide a course in math so you must know what you are doing in order to understand the sequence of steps. Woe to the user lacking in knowledge of parameters, and technospeak, and who abandons hope when faced with something more complex than a paper clip.

What you need to know how to do in Basic is write and read data to and from files. Many sample routines are provided with the instructions so even a smattering of Basic will suffice. Look at the programs long enough and you will be able to write the routines you need. There is a list of variables used in the program, so you won't accidentally try to use them in your routines. When you do write your own routines, it would be easy to just use single letter variable names or some very easy combina-

tion, since the variable names used in Autoplot are double letter.


NICE JOB. Some of the graph types include dashed line, line and mark, mark, mark and range, shaded, boxed, and barred graphs. These are the graphs many of us are familiar with and the program and plotter combination do a very nice job of producing professional results.

Graphs, plots, and drawings can be enclosed in rectangular or square boxes, colors can be changed, and linear and logarithmic axes can be mixed in one graph.

The manual doodling feature is quite nice. Exquisite little drawings can be done with no trouble. Pen color changes are easy to do, and, we found out, it takes no effort to change colors for graph borders as well as the graphs themselves.

Autoplot is a very good program incorporating features that larger programs and machines use. Our hope is that when the program becomes commercially available, most of the routines people will need will be incorporated in the program and able to be called up from a menu.

GREAT LITTLE ITEM. The CGP-115 printer/plotter is also a great little item. The printer/plotter is a bargain for the price — until you get hooked on it and pay for those expensive pens that have a limited life. The pens look suspiciously like cut off Bic pen tips but they are far too costly to have come from such a humble start.

This is a good program for programmers to get into and add routines to do other graphics. It comes highly recommended. 

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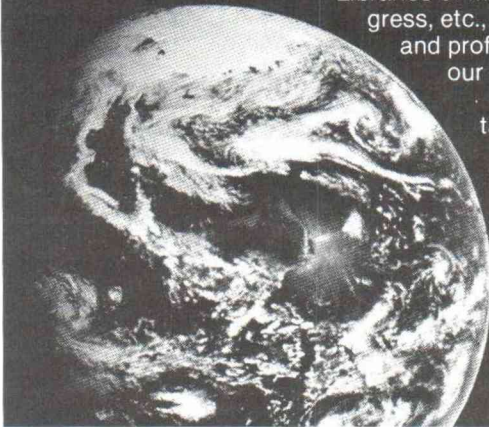
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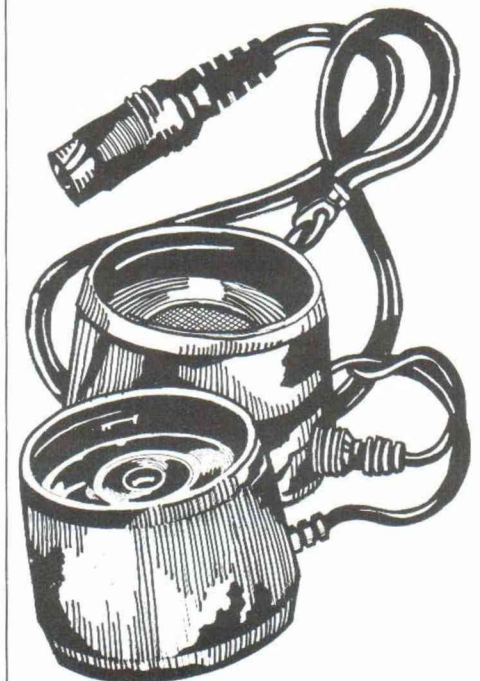
By TERRY DETTMAN

Let's face it, one of the principal reasons for the Model 100 is its mobility. It allows you to go from one place to another and still have significant computer power at hand.

Built-in ability to do word processing (such as I'm doing right now) and telecommunications are very important parts of that portability. During a recent trip to New York, my Model 100 was in daily use preparing reports, articles, and keeping records.

Every day I connected to a telephone network to transfer messages, submit articles to publishers, and so forth. Without the Model 100, many things I accomplished might still be undone.

CONNECTIONS. Since telephone connections turned out to be an important part of the trip, it pays to make sure the connection is as easy as possible. The problem with tele-



phones and travelling is you can't say ahead of time what your connections will be.

When I left for New York, all that was available was the direct connect cord system. I carried that with me, but lo and behold, most phones I came in contact with couldn't use it.

In particular, the phone in my hotel room was directly wired into the wall with no modular jack. The only way phone communications became possible was by employing either lines I could get a modular jack on (all too few) or some other subterfuge providing either too much weight or too little security.

By the time I got back, I had committed myself to getting the acoustic coupler system when it became available. About a week later, it appeared for \$39.95 at my local Radio Shack Computer Center.

THE LAST ONE. When I saw it, it was the last one in the store, having sold out in just a few days. Naturally, I bought it as soon as I saw it and have used it heavily since for communicating where it is hard or impossible to get a modular jack.

After playing with the unit for awhile just to get the feel of it, I rapidly began putting the coupler to regular use. In one call I made recently, I needed to test out a computer's modem from the office, but there was only a standard office system without jacks. Out came the acoustic coupler.

In my own office area, there are modular jacks we have added with adapters to the phone line, but they are inconveniently placed or already in use for other equipment. It has been a help to simply plug in the coupler. I find that the more I have used it, the more cases I've found where its use becomes a time saver.

DISADVANTAGE. As with anything, you lose something when you go to the acoustic coupler. While using it, there is no auto-dial/auto-login ability with the Model 100. Having been used to using acoustic couplers, this has been no great problem even though the automatic features of the direct connect modem have become very important to me.

I was impressed by the size of the coupler, consisting as it does of just a cable and two rubber cups. The

cable has a DIN plug on one end for the Model 100. It is permanently connected to the microphone cup, but the speaker cup has a removable plug. Do they have something up their sleeves? It doesn't give any indication in the manual why this isn't just permanently wired.


I have heard from some people they have trouble using the cups. I'm not sure what the problem is other than they are a little tighter than I'm used to for couplers, but I look on that as all to the good since a tight cup is less likely to leak sound that could lead to errors. Given a little practice, I find I can easily call the number and install the cups after connection without losing the computer at the other end. In the worst case, I connect the transmitter end before calling and then the receiver after the connection is made.

One has to remember there is a switch setting on the left side of the Model 100 for ACP (Acoustic Coupler) or DIR (Direct Connect). I've found it easy to forget this and wonder for a moment about why one or the other wouldn't work. But I got used to it.

DATA ERRORS. Anyone who uses acoustic couplers regularly finds they are more susceptible to data errors than direct connect modems. However, I have yet to see anything recognizable as a data error from any connection I've made with the Model 100 acoustic coupler. So far its performance has been as reliable as couplers costing many times more money.

In the final analysis, the purpose of a review like this one is to let you know whether the product is worthwhile. In this case I feel safe in saying that it is.

NOT FOR EVERYONE. An acoustic coupler is not for everyone. If you run primarily out of your home or office and have available modular jacks that you can use, the direct connect cable is a better choice for you.

If you must have the auto-dial, auto-login ability, you must have the direct connect. But if your needs are primarily for portable computing, the acoustic coupler is the best overall compromise to let you carry your telecommunications with you. 

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NEW PRODUCTS



DELUXE BAR CODE READER FOR MODEL 100

A laser bar code reader that's plug-compatible with the Model 100 is being offered by Metrologic Instruments Inc., 143 Harding Ave., Bellmawr, NJ 08031. It sells for \$1800.

The Scanhandler MS190 weighs 15 ounces and contains all the optics and electronics required for non-contact scanning. Having a maximum depth of field of 10 inches, the laser operates at 150 scans per second and has a near 100 percent first read rate. It delivers an audible and visual indication of a successful read.

Metrologic claims its scanner is the first laser bar-code scanner to include scanning, decoding, and communications capabilities in a single unit.

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Want to start a business with your computer? What kind of business, you ask. Well, the Business Information Exchange, a subsidiary of Morrison, Butterfield & Boyle Ltd., P.O. Box 4759, Santa Barbara, CA 93103, has 100 suggestions for you.

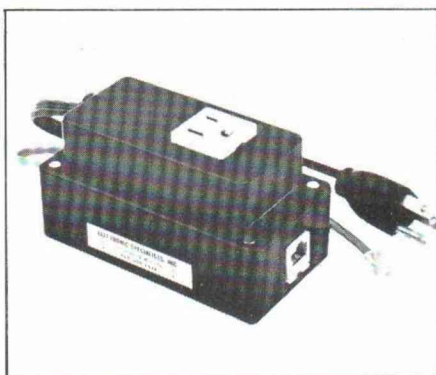
Morrison publishes reports on how to start various kinds of home computer businesses. The reports cost from \$9.95 to \$14.95 and include how to start a computer dating service, a financial investment service, and many more. A catalog listing Morrison's 100 reports and briefly describing each can be obtained from the company for \$1.

MSTRAP ADDS TRANSPORTABILITY TO YOUR 100

A convenient way to shoulder your 100 has been devised by the Donald Steohens Company, 1962 Pommel Ave., Las Vegas, NV 89119.

The device, called an Mstrap, is handle that attaches to the 100, making the micro easier to carry. Mstrap costs \$12 and is black, to match the color scheme of the 100.

According to Stephens, you can attach the handle in less than five minutes and the operation will not void your warranty.



PROTECT YOUR 100 FROM POWER SURGES

Electronic Specialists Inc. of Natick, MA 01760, is marketing a device to suppress power line and telephone voltage spikes. The PDS-11/SUP costs \$81.95 and has suppression on red and green phone lines with yellow and black lines brought straight through. A 6500 amp suppressor protects the AC power line.

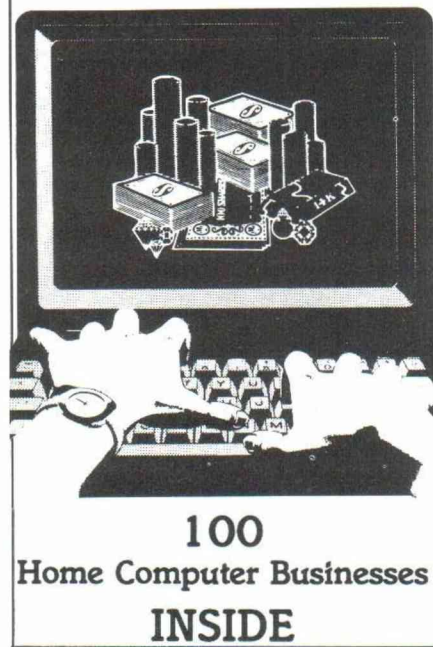
LEARN TO TYPE WITH YOUR PORTABLE

Instant Software, Elm St., Peterborough, NH 03458, has adapted its Typing Teacher software, designed for the TRS-80 Models I and III, to the Model 100.

The seven-part package familiarizes you with key locations, goes through words and phrases, and ends with complete mastery of the board. Screen diagrams show correct finger placement and related proper techniques.

Typing Teacher costs \$17.95 and will work in a minimally configured 8K machine.

THE PERSONAL COMPUTER OWNER'S KEYSTROKES TO SUCCESS GUIDE



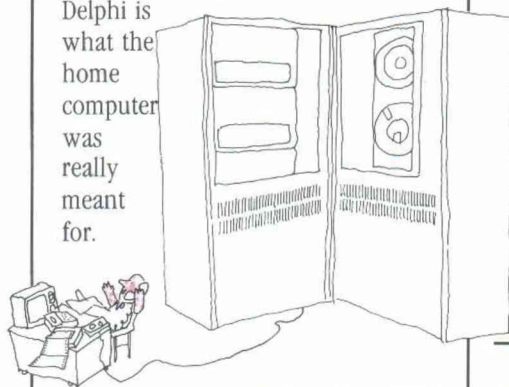
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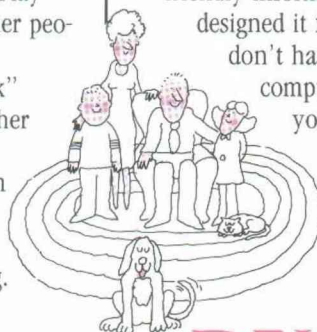
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SOUTHWEST BELL SLAPS TARIFF ON TELECOMPUTING

Greed is the most despicable of all human traits. Unfortunately it's a common one. Maybe that's what makes it so repulsive. Greed breeds jealousy and hate as sure as an August rain breeds mosquitoes. Webster defines greed as, "Wanting or taking more than one needs or deserves."

We received the following letter a few months ago from Robert Braver of the Oklahoma Modem Users Group:

SERIOUS PROBLEM. "I am writing you in regard to a serious problem that the modem users in the state of Oklahoma are facing.

"Southwestern Bell Telephone Company's Oklahoma tariffs call for the charging of an 'Information Terminal Service' rate for anyone connecting a computer to the telephone lines via a modem.

"This rate is approximately 500 percent higher than the standard residential base rate. The present residential rate is around \$9 per month. If you connect a computer to the line with a modem, even if you only call CompuServe once a month, the rate jumps to a whopping \$45.90. The additional charge for Touch Tone service increases from \$1.25 to \$3.50 per month. This will undoubtedly increase dramatically if Bell gets the \$301,000,000 increase they recently applied for with the Oklahoma Corporation Commission.

DRAMATIC EFFECT. "Obviously this tariff dramatically affects the entire industry, as the tariff for all practical purposes prohibits non-commercial, hobbyist modem use.

And if Bell is permitted to get away with the enforcement of the tariff (as they are now beginning to do) a precedent will be set for other local operating companies to follow in other states.

"Apparently, Bell is just now beginning to apply this 1965 tariff to non-commercial modem and computer users. And although Bell representatives have fallen back on the age of the tariff as an excuse, they have no intention of exempting residential modem use from the provisions of the tariff.


"Therefore, the Oklahoma Modem Users Group (OMUG), is fighting Southwestern Bell and their unfair tariff. We are doing this through media attention, responsible organization, speaking at Corporation Commission hearings, and if all else fails, we will institute legal action to force a change in the tariffs.

NATIONAL ATTENTION. "Because of the national attention this issue is just now beginning to attract, and the fact that we desperately need more support, we have taken several steps to ensure that people are informed. We have a mailing list, and we send out a biweekly newsletter covering the latest updates on the tariff situation. We have also established a 24-hour hotline which is updated daily with a one to three minute recorded announcement. The number is (405) 360-7462."

If the increased rate meant special lines for private computer transmissions, Southwestern Bell might have an argument. But what they are trying to do is provide the same service at a greatly increased rate. In a way,

they are attempting to charge by type of use rather than type of service rendered. I have held business conversations from my home phone. Does that mean one day I will be required to pay a business rate? Will I be charged a discounted rate for calling charitable organizations?

DOMINO THEORY. Robert Braver and his users group are to be applauded for their efforts. Enough is enough. In the past, the individual has been almost powerless against the mandates of mega-corporations masquerading as public service utilities. Now that the personal computer has given the individual a measure of power, the "public service" utilities are moving take it away from him. Southwestern Bell is just the beginning. If it implements its exorbitant rate hike on modem users, others will follow suit. The time to stop these proposals is now.

Get involved. The next time someone tries to reach out and touch you, they may be really trying to reach out and grab your wallet. I don't want to give up my modem — do you? 

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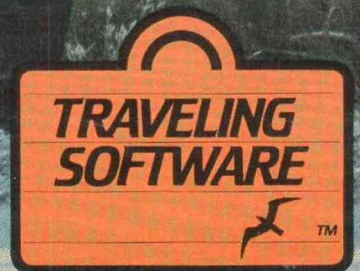
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